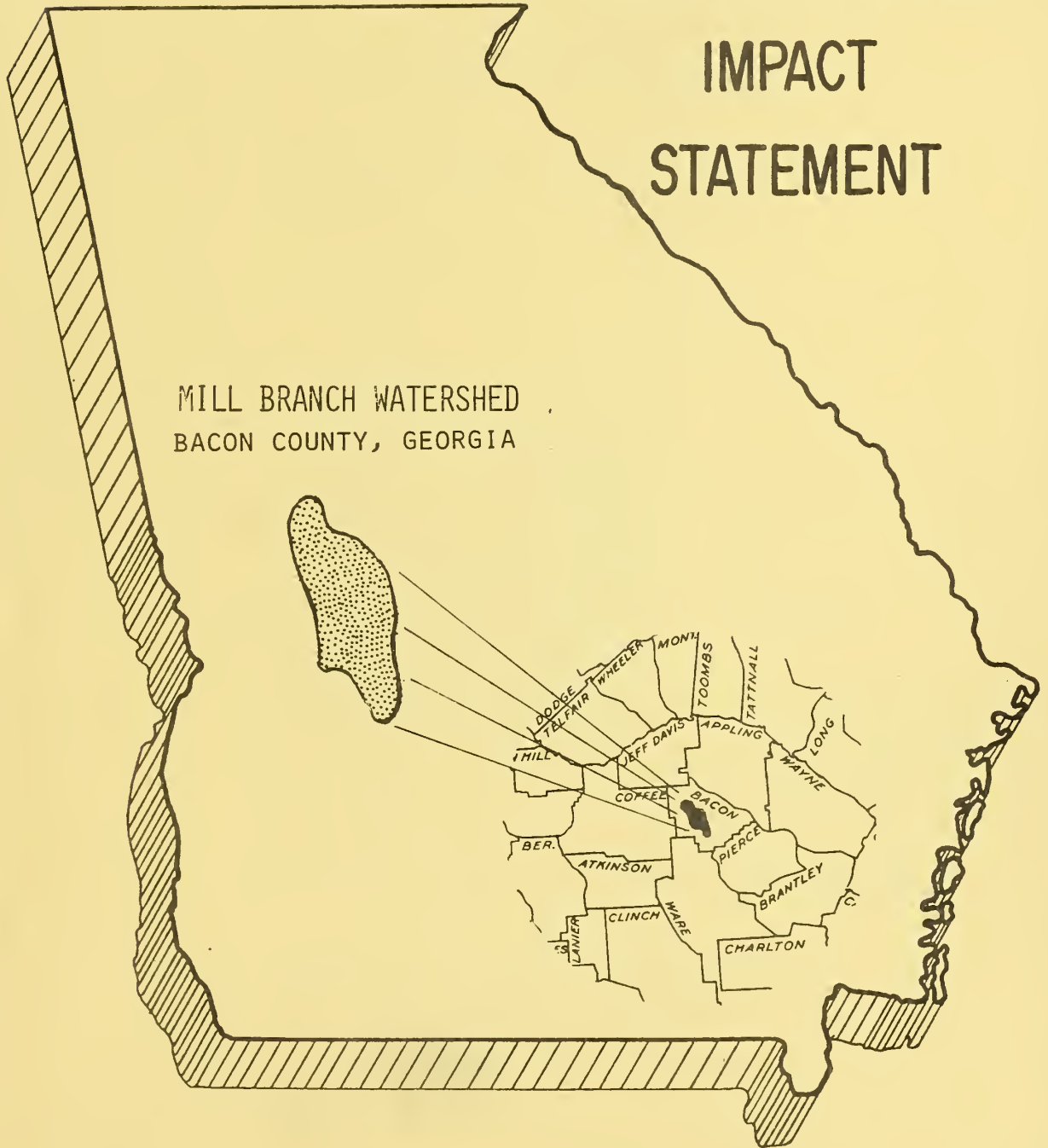


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ENVIRONMENTAL IMPACT STATEMENT

MILL BRANCH WATERSHED
BACON COUNTY, GEORGIA



SOIL CONSERVATION SERVICE
U. S. DEPARTMENT OF AGRICULTURE

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Mill Branch Watershed Project
Bacon County, Georgia

FINAL ENVIRONMENTAL IMPACT STATEMENT

Dwight M. Treadway
State Conservationist

Soil Conservation Service

Sponsoring Local Organizations

County Government of Bacon County
P.O. Box 356, Alma, Georgia 31510

Altamaha Soil and Water Conservation District
P.O. Box 797, Waycross, Georgia 31501

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Soil Conservation Service

Athens, Georgia 30601

USDA ENVIRONMENTAL IMPACT STATEMENT

Mill Branch Watershed Project

Bacon County

Georgia

Prepared in Accordance With
Sec. 102(2)(C) of P.L. 91-190.

SUMMARY

I. Final

II. Soil Conservation Service

III. Administrative

IV. Brief description of project purposes and action: A project for watershed protection, flood prevention, and agricultural and forestry water management in Bacon County, Georgia, to be implemented under authority of the Watershed Protection and Flood Prevention Act (PL-566, 83d Congress, 68 Stat. 666) as amended.

V. Summary of environmental impacts including favorable and adverse environmental effects.

Gross erosion will be reduced by approximately 11,000 tons annually; aesthetics of the area and farming efficiency will be improved. Ponds will be managed more efficiently for fish production and family recreation. Approximately 5,415 acres of agricultural and pine forest land located on 153 farms will be protected, thereby reducing damages by 70 percent or from about \$140,236 to \$42,070 annually. Additional benefits of approximately \$60,941 annually will be attributable to improved efficiency and more intensive land use. Road damages will be reduced by \$28,300 annually. Wildlife habitat on 150 acres will be improved by planting food and cover plants. Aquatic habitats for local types of wildlife that associate with aquatic ecosystems will be expanded by the water holding characteristics of constructed channels. A better distribution of water for wildlife will be provided. Floodwater-type mosquito populations will be reduced. New jobs will be created and the local economy stimulated. Reducing excess surface water will allow prescribed burning of pine forest land, which in turn will reduce the probability, size, and intensity of wildfires with associated air pollution. Prescribed burning will improve vector control and wildlife habitat. Reduction of erosion and sediment with attendant pollutants will improve surface water quality.

Approximately 7 acres of cropland and 44 acres of forest land will be replaced with project channels. Forest land wildlife habitat on 211 acres

will be degraded by clearing rights-of-way. A shift to a less wet condition on improved pine forest areas may increase the fire hazard in areas where prescribed burning has not been done. Water quality in intermittent and ephemeral streams will be temporarily degraded during and immediately following construction. Approximately 6 acres of forest land will be replaced by farm ponds expected to be constructed by land-owners.

VI. List of alternatives. (1) Accelerated conservation land treatment. (2) Accelerated conservation land treatment with excavation on laterals and pumped outlets into leveed mains. (3) Accelerated land treatment, flood proofing of fixed flood plain improvements, and public acquisition of water problem areas for uses more tolerant to excess water conditions. (4) No project.

VII. List of federal, state and local agencies and others from which comments were recieved.

Department of the Army	State Clearing House (secures
Department of Health, Education,	and consolidates comments from
and Welfare	all interested state agencies
Department of the Interior	and departments)
Department of Transportation	Regional Clearing House
Environmental Protection Agency	(Southeast Georgia Area
Department of Transportation,	Planning and Development
State of Georgia	Commission)

VIII. Draft Statement Transmitted to CEQ on February 21, 1975.

USDA SOIL CONSERVATION SERVICE
FINAL ENVIRONMENTAL IMPACT STATEMENT^{1/}

for

Mill Branch Watershed, Georgia

AUTHORITY

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83d Congress, 68 Stat. 666, as amended.

SPONSORING LOCAL ORGANIZATIONS

Bacon County Government
Altamaha Soil and Water Conservation District

PROJECT PURPOSES AND GOALS

The overall objectives of the project are to improve the economic and environmental conditions of the watershed through water and related land resource conservation and development. More specific objectives are as follows:

1. To provide watershed protection needed to reduce erosion and bring soil losses within tolerable limits.
2. To improve the management of cropland, pasture and forest land areas.
3. To reduce damages caused by floodwater and saturated soil conditions.
4. To minimize the irreversible and irretrievable commitment of natural unrenewable resources in the pursuit of the objectives above.

Pasture, cropland, and wildlife habitat treatment goals were developed by professional agricultural workers and biologists, and these goals were correlated with Soil and Water Conservation District goals for achieving adequate treatment as shown in the section entitled PLANNED PROJECT. Conservation land treatment objectives can be accomplished by acceleration of existing programs. No major change in agricultural land use is expected or desired by the sponsors. Intensification of present uses, made possible by damage reduction and better soil conditions, will enable accomplishment of project objectives.

^{1/} All information and data, except as otherwise noted were collected by the Soil Conservation Service and Forest Service, U.S. Department of Agriculture.

The land treatment program for forest land was developed from a field survey of the watershed. The proposed program is based on treatment needs greater than the existing programs can supply. The land treatment needs are adjusted for expected landowner participation and length of the installation period of the project. The water control program for forest land is designed to remove runoff from a storm with an average recurrence frequency of every two years and a duration of 24 hours. The system is designed so that this removal will be complete 5 days after the storm ceases. Research by the U.S. Forest Service has shown that this level of water management, which is designed to reduce the seasonal water table to twenty-four inches below the soil surface, will give the desired benefit to increased growth of pines. Removing floodwaters from the ground surface within a five day period is also sufficient to protect young pine trees from mortality.

Another factor taken into consideration during the formulation of the forest land treatment program was the increased level of management made possible by easier access to the forest stands. Landowners and operators have the opportunity to better schedule various cultural practices needed to realize maximum benefits of the water control program and provide increased protection to their forest lands.

Land use changes are expected to be limited primarily to road construction, residential and industrial development, airport expansion, and fruit and berry crop cultivation. These are trends and are not expected to be influenced by the project. Soil types and land capabilities of a major portion of land now in forest land in the problem areas are not suitable for agronomic crops.

The following levels of protection have been agreed to by the Sponsoring Local Organization and the Soil Conservation Service.

<u>Land Use</u>	<u>Frequency</u>	<u>Storm Duration</u>	<u>Period of Runoff Removal</u>
Truck and specialty crops and rural yards, gardens, and related areas	5-year	24-hour	one day
Other cropland	2-year	24-hour	one day
Pasture	2-year	24-hour	two days
Forest (Pine)	2-year	24-hour	five days

Economic feasibility, needs, and objectives determined size and location of improvements. There are no suitable floodwater retarding structure sites in the watershed. Few well-defined stream channels exist in the

problem areas; consequently, all project objectives cannot be met by improvement of existing channels. Bacon County officials have constructed several short reaches of open channels at road crossings in an attempt to protect bridges, culverts, and road fills.

Effects of possible flood stage increases downstream from project works of improvement were considered. Three farm ponds are located in series on the main stem of Mill Branch below the major portion of proposed construction. Above each of the two uppermost ponds are flat wooded areas approximately one-half to three-fourths mile long. These wooded areas serve as effective sediment traps and possible oxidizers of pollutants. Below the downstream pond, the hardwood forest extends for a distance of approximately six miles to the end of the watershed. Flood stage increases induced by the project will be retained within these forested boundaries.

PLANNED PROJECT

Conservation Land Treatment Measures

Practices needed to achieve objectives for the protection and development of watershed land resources will be planned and applied in accordance with cooperative agreements between landowners and operators, the Altamaha Soil and Water Conservation District, and the Georgia Forestry Commission. Among the most important features of this program will be the treatment of about 4,850 acres of cropland, 150 acres grassland, 4,800 acres forest land, 80 acres of miscellaneous land, and 10 acres of critically eroding land. Goals are to improve some areas for wildlife by including in conservation plans provisions for food and cover plantings of field borders, corners, odd areas, and openings in forest land. Treatment of cropland will consist of combinations of the following practices:

1. Installation of conservation cropping systems: The practice of growing crops in combination with needed cultural and management measures. Cropping systems include the use of rotations that contain grasses and legumes, as well as rotations in which the desired benefits are achieved without the use of such crops. Alternative cropping systems that will hold soil loss to tolerance limits as recorded in the publication entitled "Soil Loss Prediction for Georgia" will be stressed. Soil loss tolerances for Tifton and Norfolk soils are 4 tons per acre and for Lakeland 5 tons per acre annually. These are the three principal "upland" soils with erosion hazards in the watershed. A wide range of alternative cropping systems capable of holding soil loss at or below allowable or tolerable limits are available to landowners.
2. Installation of minimum tillage: The practice of limiting the number of cultural operations to those that are properly timed and

essential to produce a crop and prevent soil damage. This practice retards or prevents deterioration of soil structure; reduces soil compaction and formation of tillage or "hardpan"; and improves soil aeration, permeability, and tilth.

3. Installation of crop residue use: The practice of using plant residues, in lieu of burning or other means of disposal, so as to protect fields during critical erosion periods. This practice conserves moisture, increases infiltration of rainfall, reduces soil losses, and improves soil tilth.
4. Installation of land smoothing: The practice of removing irregularities on the land surface by use of special equipment. The purpose is to allow a better distribution of water and to facilitate installation of irrigation, drainage, and parallel terrace systems.
5. Installation of water disposal systems, consisting of terraces, grassed waterways, subsurface drains, and shallow field drainage laterals. These will be applied singly or in combinations as dictated by the needs of individual fields.

Grassland treatment will consist of pasture and hayland planting and management. Management will consist of proper treatment and use designed to provide soil protection, to reduce water runoff, to maintain or improve quality and quantity of forage, and to prolong the life of desirable forage species. Wet soils used for pasture will have water disposal practices applied. These will consist of shallow lateral drainage ditches and subsurface drains.

Severely eroded areas (critical areas) will be stabilized by grading, shaping, liming, fertilizing, planting, and mulching. Grasses and legumes will be planted, and where the sites are suitable, species of oak trees suitable for wildlife food production will be added. Treatment of miscellaneous land will consist primarily of proper management and protection from erosion.

Better management of approximately 23 existing ponds to make them more attractive and to provide better habitat for game fish, waterfowl, and shore birds will be emphasized. New farm ponds to be constructed will consist of dam construction on intermittent or ephemeral watercourses. These ponds will provide manageable waters for fish production; water for irrigation; water for livestock; water to facilitate better grazing distribution; water for wildlife; and sources of escape fish to populate watercourses.

To facilitate the conservation land treatment program, technical assistance will be provided to accomplish soil surveys of the remaining 5,000 acres of the watershed not mapped.

The forest land treatment program was developed from a study of land treatment needs prepared by the U.S. Forest Service in cooperation with the Georgia Forestry Commission after field surveys of the watershed made by the U.S. Forest Service and from land use recommendations made by the Soil Conservation Service. In order to realize the maximum benefit from the forest land, the land must be placed under proper management. This will include the preparation of 130 forest management plans, the planting of 1,860 acres of trees in understocked areas, and the improvement of 2,940 acres by other cultural practices such as thinnings and improvement cuttings. Tree plantings will include several species of oaks suitable for wildlife food production. These management practices also include the installation of lateral drainages in excessively wet areas.

Interplanting will be for the purpose of reinforcing existing young stands; improving the ultimate quality of the forest crop; improving species composition in hardwoods; reducing soil losses; and improving watershed hydrologic conditions.

Thinning and improvement cuttings consist of the removal of merchantable trees from an immature stand. The purposes to be served include maintenance of a well-spaced stand of desirable trees; provision of periodic income from sales of forest products; increase in growth of remaining trees; improvement of wildlife habitat; increase of forage production; provision for continued soil protection; and enhancement of the natural beauty of the area. Management practices also include the installation of lateral drainages in excessively wet pine forest areas.

In addition to these accelerated treatment measures, the existing Cooperative Forest Management and Cooperative Forest Fire Control programs will be available to provide assistance to private landowners and operators.

Structural Measures

Planned structural measures consist of approximately 229,500 feet of multiple purpose open channels for flood prevention and agricultural and forest water management (Appendix C). These measures are located and designed to serve groups of landowners. Floodwater and drainage outlets for agricultural and pine forest land will be provided for all farms having such a need.

Present conditions along the path of proposed channel work are similar. Soils to be excavated are mostly Pelham and Rains with some scattered areas of Plummer. These soils are poorly drained and nearly level (slopes range from 0-3 percent), and they occur along drainage-ways and in depressions. They are well suited for production of forest products when water control measures are installed. Profiles vary, but generally the surface is a light gray to dark gray loamy fine sand. Generally subsoils are gray sandy clay mottled with yellowish brown to brown. Vegetation consists principally of mixed pine and hardwoods with an

understory of water tolerant shrubs including gallberry, wax myrtle, and palmetto. Excavation through these soil types is necessary to provide protection to adjacent areas of better soils used for agricultural crops, pasture, and forest products.

With the exception of 0.3 mile of natural channels and 2.5 miles of man-made ditches, the channel work will be done where no well defined channels exist. Flow conditions are ephemeral on 31.3 miles proposed and intermittent on the remaining 9.3 miles.

Basis for selection of flow capacity used in open channel design is to provide desired levels of protection for various crops and land uses. Runoff removal time for each land use for a selected storm is shown in the PROJECT PURPOSES AND GOALS section. Channels protecting cropland will be of sufficient depth for use as subsurface drain outlets. These measures will provide flood prevention and drainage benefits to pine timber, corn, soybeans, vegetables, fruit crops, pasture, and hay.

Channels will be excavated to 1/2:1 side slopes except in short sections where flatter slopes are needed for aesthetic purposes. Most sections will retain cross-sections as excavated while some will undergo a natural re-sectioning to a parabolic cross-section immediately following excavation. Constructed channels will provide adequate depth and capacity. Ditch banks and excavated material will be vegetated at the time of channel construction. If the season in which construction is accomplished is not compatible with establishment of perennial vegetation, temporary planting (annuals) or mulching will be utilized until conditions are right for planting perennials.

The low sediment delivery rate will permit deferred maintenance or re-sectioning at 25 to 50 year intervals. Access roads will not be needed for this maintenance procedure. Plantings to enhance aesthetic values at needed locations will be a part of project installation.

An analysis was also made to calculate increases in water surface elevations in the emergency spillways of three farm ponds constructed in series on the main stem of Mill Branch below proposed channel work. These ponds, with principal spillways of metal pipe, were constructed to Soil Conservation Service specifications in 1954 and are near the end of their design life. Flood routing of storms ranging from a 10-year, 24-hour to 100-year, 6-hour duration indicate a maximum increase of 0.6 foot for the downstream dam and 0.5 foot for each of the two located above. The SCS Engineering Memorandum - 27, class "a" freeboard hydrograph after project, shows an increase of 0.7 foot for the lower dam, and 0.3 foot for each of the two above. Bacon County will secure flowage easements for this increased flow generated by installation of project structural measures and will assume responsibility for repair of the emergency spillways of the ponds should damage occur.

Temporary environmental protection weirs will be installed at approximately 9 locations on Rigdon Branch and laterals 3B, 20R, 13M, 31M, 33M, and 35M. These planned structures consist of rock rip-rap construction with drop ranges from 1.0 to 2.0 feet (APPENDIX E). One structure at station 466+00 on Rigdon Branch will utilize a 36 inch diameter asphalt-coated, corrugated metal pipe equipped with a flashboard riser. The principal function of these loose rock weirs will be to reduce grade and velocities until vegetation has become established and the aged condition reached.

Land rights for project channels consist of easements to approximately 255 acres of forest land and 41 acres of agricultural land and alteration of bridges, culverts, and underground utilities at approximately 61 locations.

No person, business, or farm operation will be displaced as a result of project installation.

Land use changes expected to result from the planned project are as follows: forest land changed to open channels - 44 acres, and cropland changed to open channels - 7 acres.

To minimize permanent damage to the relatively low value forest wildlife habitat to be cleared for rights-of-way, construction will be from one side, leaving the tree canopy undisturbed on the opposite side. Oaks or other mast producing trees, and den trees of value to wildlife will be left when possible. Spoil and channel banks will be vegetated immediately after excavation and plantings of oaks and other trees and shrubs for wildlife food and cover will follow (Appendix C).

In order to reduce the potential sediment damage to downstream reaches as a result of channel construction, the following measures will be incorporated into channel design and construction.

1. A vegetated buffer zone of at least 500 feet will be maintained between channel work and the upstream ends of the ponds. For main Mill Branch channel this buffer strip will be approximately 2,500 feet.
2. Sediment traps will be designed to accommodate estimated channel erosion during construction. The traps will consist of excavating storage reservoirs within the channel at locations where sediment deposition is anticipated. Sediment traps will be monitored and appropriate action taken during the project installation period to insure that they function as desired.
3. As channel work is installed, berm and spoil areas will be vegetated with temporary vegetation. This will be followed

within 6 to 12 months with permanent grasses, wildlife plantings, and mast producing trees. Native vegetation, which is prolific in this area, also plays a beneficial part in vegetative stabilization.

Excavated material will be placed so as to reduce to a minimum the required clearing and disturbed areas. No construction is planned along perennial streams or through high value wildlife habitat. Breaks will be left in spoil banks as needed for side drainage to prevent water from being trapped behind spoil thereby creating mosquito breeding areas. Pipe drop inlets will be installed at all side drains where erosion could be a problem (Appendix D).

Construction will be in accordance with SCS Engineering Memorandum - 66 in order to minimize soil erosion and water and air pollution. This memorandum and other guidelines establish a Service policy for complying with provisions of the Water Pollution Control Act (PL 84-600, as amended). Debris from clearing the right-of-way will be buried under spoil or placed to one side of the right-of-way. Prior to beginning project operations, plans for solid waste disposal will be submitted to the Solid Waste Management Service, Environmental Protection Division, Georgia Department of Natural Resources for approval.

An archeological survey of planned excavation areas has been performed under contract with The University of Georgia, Department of Anthropology. Based on this survey, the proposed watershed project is not considered to pose a threat to any archeological resources.

There are no known archeological or historical resources in the area of proposed construction. The National Park Service, State Archaeologist, State Department of Natural Resources and other state and federal agencies will be notified immediately after the project is authorized. Appropriate officials will also again be notified well in advance of construction of the various construction units. Supervisory personnel and contractors will be continuously alert for any evidence of artifacts or other objects of archeological, historical, or mineral importance at construction sites. If any are found, the appropriate federal and state officials will be promptly notified. The provisions of Public Laws 86-523, 89-665, and 93-291 will be carefully adhered to during project installation.

A project agreement is to be entered into by the County and the Service prior to the issuance of invitations to bid for construction of each unit. This agreement will outline specific agreements between the County and the Service regarding construction, including cost-sharing and compliance with laws, permits, regulations or agreements related thereto. The Service will consult with the County as necessary in the accomplishment of the agreement.

Provisions for Operation and Maintenance

Agricultural and forest land treatment measures will be maintained by landowners and operators under terms of agreements with the Altamaha Soil and Water Conservation District. The industrial owners and operators of forest land will furnish the technical assistance necessary for operating and maintaining the measures on their lands. The Georgia Forestry Commission will continue to furnish management assistance to small private landowners through the existing Cooperative Forest Management Program and fire control activities through the existing Cooperative Forest Fire Control Program.

The Game and Fish Division of the Georgia Department of Natural Resources and the Soil Conservation Service will provide technical assistance to interested landowners in preserving or enhancing wildlife and fisheries resources.

Bacon County will be responsible for operation and maintenance (O&M) of approximately 229,500 feet of multiple purpose open channels and the emergency spillways of three farm ponds discussed in the section entitled Structural Measures. The estimated annual O&M cost is \$17,541. An establishment period shall extend 3 years from the date channel work is completed. During the establishment period the State Conservationist may approve PL-566 cost sharing for any additional work required to obtain an adequate vegetative cover. Approval of the Administrator is required for PL-566 cost sharing for other repair or additional work on completed channels. Cost sharing will not exceed the ratio authorized for the original construction. Bacon County agrees to maintain structural measures in accordance with state and local health regulations.

The County Commissioners have already purchased heavy equipment for the purpose of accomplishing the county's share of construction, operation, and maintenance in Ten Mile-Briar Creek operational watershed and Mill Branch when it becomes operational.

Specific operation and maintenance plans and agreements will be developed for each structural measure prior to execution of project agreements. These agreements will contain a reference to the State Watersheds Operation and Maintenance Handbook as developed by SCS. Representatives of the Soil Conservation Service and Bacon County will make a joint inspection annually or after unusually severe floods for 3 years following installation of channels. Inspection after the third year will be made annually by Bacon County, and a report will be prepared by them and a copy sent to the Soil Conservation Service representative. The Altamaha Soil and Water Conservation District may assist Bacon County with these inspections.

Maintenance of conservation land treatment measures will consist mostly of mowing, fertilizing, liming, and proper plowing of terraces and maintaining other water disposal practices. Maintenance likely to be needed on the improved channels will consist of replacing galvanized asphalt coated corrugated metal pipe, keeping channels clear of obstructions

such as tree tops, brush, debris, and dense vegetation that may tend to block normal flow, and replacing rock that may be dislodged from the temporary environmental protection weirs. If at some point in time these structures are no longer functional, they will be removed and the sites shaped and vegetated. It is not anticipated that there will be large deposits of sediment in the channels which will require clearing out during the evaluation period.

Maintenance will be accomplished in a manner designed to disturb established vegetation as little as possible. Areas disturbed will be revegetated immediately.

Project Costs

The conservation land treatment program, including soil surveys, is estimated to cost \$427,800, with \$49,400 coming from PL-566 funds and \$378,400 from other sources.

Structural measures are estimated to cost \$972,800 with \$730,300 coming from PL-566 funds and \$242,500 from other sources.

Total estimated project installation cost is \$1,400,600, with \$779,700 coming from PL-566 funds and \$620,900 from other sources.

ENVIRONMENTAL SETTING

Physical Resources

The Mill Branch Watershed with a drainage area of 21,319 acres, is located in Bacon County in southeast Georgia. Alma, population 3,750, is the county seat of Bacon County; and it is located on the east boundary of the watershed. Waycross, population 19,000, is located thirty-two miles south of Alma; and Douglas, population 10,195, is twenty-two miles west. The watershed population is approximately 2,750, with 1,650 of these residing in Alma and 1,100 in rural areas.

The watershed, a part of the Satilla River Basin, is located in the South Atlantic Gulf Land and Water Resource Region. This region encompasses twenty-four distinct river systems and numerous minor systems draining an area of approximately 276,000 square miles. Its average annual runoff of 197 billion gallons per day (bgd) is the third highest in the United States. Anticipated population and economic growth throughout the region will heighten demands for prudent management of water and related land resources in the future.^{2/}

The watershed is a part of the Atlantic and Gulf Coast Lowland Forest and Truck Crop Subregion, an area characterized by poorly drained flatlands underlain by productive aquifers. Streams in the subregion are typically unreliable for water supply, and few reservoir sites exist. The watershed is similar to the subregion in these respects.

^{2/} "The Nation's Water Resources," Water Resources Council, Washington, D.C., 1968, Chap. 2, pp 1-4.

With the exception of a four square mile area north of Alma, of which a portion is within the city limits, and the lower southwest section of the watershed, most drainage patterns are erratic and poorly defined. This condition compounded by very flat topography creates a flooding and poor drainage problem on approximately 5,415 acres of agricultural and pine forest land. Water courses are dry during periods of low rainfall. Typically, these water courses or drainageways are wide and flat. Intermittent and ephemeral flow moves through these areas at random.

Average annual rainfall in the watershed is about 46.6 inches. July is normally the wettest month with 5.7 inches and November the driest with 2.2 inches. Temperature averages about 66 degrees for the year, ranging from around a 50 degree average in January to around 81 degrees in July. The freeze free growing season averages about two hundred fifty days, extending usually from early March to just past mid-November.^{3/}

Topography of the watershed is flat to gently rolling with elevations ranging from a high of about 220 feet above mean sea level (msl) in the northwest part, to 136 msl at the outlet. The principal geologic formation underlying the watershed is the Hawthorne. This formation is considered to be Miocene in age, with the upper member consisting of interbedded sands and sandy clay. Most soils in the watershed were formed from this material.

A series of limestone formations underlie the Hawthorne, ranging in age from Miocene to Upper Eocene. Collectively, these limestone beds form what is called the principal artesian aquifer of the Coastal Plain. Most water for domestic and industrial uses in the area is supplied from this aquifer which lies at a depth of 360 feet in the vicinity of the Alma city well. The watershed is not considered a major recharge area for the aquifer.^{4/} Recharge of the principal artesian aquifer by surface water occurs in areas in which the aquifer is at or near the surface. Some recharge also occurs in areas in which the aquifer is connected with the surface by a series of solution cavities known as sinkholes. The outcrop region for the aquifer comprises an area approximately 40 to 100 miles wide, that lies parallel to and south of the fall line. This region is widest in the southwest corner of the state, where there is extensive karst topography, with solution cavities penetrating to the aquifer. The other karst area is confined primarily to Lowndes County along the southern boundary of the state.

^{3/} "Climatological Data - Annual Summary 1975," Volume 79, No. 13, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data Service.

^{4/} Stephen M. Herrick and Robert C. Vorhis, "Subsurface Geology of the Georgia Coastal Plain," Georgia Department of Mines, Mining and Geology, Information Circular 25, 1963, p. 277.

Remnants of two Pleistocene shorelines are also present in the watershed. The lower shoreline is the Okefenokee, which extends from elevation 100 to 150 feet msl and is confined to the lower extremity of the project below the confluence of Mill Branch and Big Branch. The upper shoreline, the High Terrace, extends from elevation 150 msl to the highest elevation in the watershed. Most of the project falls within the confines of this terrace, which is poorly defined, and consists only of scattered terrace remnants.^{5/}

The watershed consists of approximately 16 percent upland and 84 percent lowland. Principal upland soils include the Tifton, Gilead, Lakeland, and Norfolk series. Upland soils occur on slopes ranging generally from 0 to 8 percent, have low to moderate water holding capacity, are low to moderate in natural fertility, are strongly acid, and are low in organic matter content. Tifton is the most important upland soil with respect to intensive agricultural use, and consists of well drained soils formed in thick beds of sandy clay loam and sandy clay materials.

The principal lowland soil series are Goldsboro, Leefield, Lynchburg, Olustee, Pelham, Plummer, and Rains. These soils characteristically occur on slopes ranging from 0 to 2 percent, have a high water holding capacity, are low in natural fertility, are strongly acid, and are low to medium in organic matter content. Goldsboro, Olustee, Leefield, and Lynchburg are the most important of these for intensive agricultural purposes, and consist of deep, poorly drained, nearly level to level soils formed from thick beds of marine sand and loamy sand. Pelham, Plummer and Rains are not as well suited to intensive agriculture as Olustee, Goldsboro, Leefield and Lynchburg, but can be used for pasture. Primary use of lowland soils is forest with the exception of Goldsboro, Olustee, Leefield, and Lynchburg series.

The watershed soils have been classified with respect to agricultural use adaptations and treatment needs into the following capability classes.

Class IIe - 161 acres. Typical of this classification are deep, well drained moderately permeable upland soils of the Norfolk and Tifton series. Slopes range from 2 to 5 percent. A moderate erosion hazard exists when soils in this category are cultivated. Some soils in this capability class require drainage for crop production.

Class IIIe - 191 acres. This capability class is composed of well drained, moderately permeable soils of the Tifton and Gilead series. Slopes range from 2 to 8 percent. A moderate to severe erosion hazard exists when soils in this class are cultivated.

^{5/} F. Stearns McNeil, "Pleistocene Shore Lines in Florida and Georgia," Geological Survey Professional Paper 221-F, 1950, pp. 98-102.

Class IVe - 780 acres. This capability class is composed of well drained, moderately permeable soils of the Tifton and Gilead series. Slopes range from 5 to 8 percent. A severe erosion hazard exists when soils in this class are cultivated. Most of the acreage is in forest and grass.

Class IIs - 1,946 acres. The Norfolk series typifies this capability class. Permeability is moderately rapid and slopes range from 0 to 2 percent. On long, gently sloping fields, wind and water erosion is a slight hazard.

Class IIIs and VIIs - 307 acres. These capability classes are composed of excessively drained, rapidly permeable soils of the Lakeland series. Slopes range from 2 to 5 percent. These soils are droughty and large fields are subject to wind erosion.

Class IIw - 537 acres. This capability class is represented by poorly drained soils of the Leefield, Lynchburg and Goldsboro series. Water moves rapidly through the surface layer and slowly through the subsoil. Slopes range from 0 to 2 percent. Some type of drainage and protection from infrequent flooding is necessary if these soils are farmed successfully.

Class IIIw - 6,231 acres. Poorly drained soils of the Olustee series are typical of this classification. Water moves through the surface at moderate to rapid rates. Slopes range from 0 to 2 percent. Hazards consist of periodic flooding and wetness. The water table is at or near the surface during rainy periods.

Class Vw - 8,523 acres. This class is composed of nearly level, poorly drained and very poorly drained soils. Frequent flooding occurs and water stands at or near the surface for long periods. Plummer and Rains are the series typical of this class.

Class VIIw - 1,797 acres. This class is generally referred to as swamp land. It is composed of nearly level, very poorly drained soil that is frequently flooded. Some of these soils are covered with water for long periods in spring and early summer.

Approximately 690 acres of urban land and 156 acres of land in ponds are unclassified, and constitute the balance of the watershed area.

Land uses for the watershed as a whole, and for the water problem area are summarized in the following table.

<u>Land Use</u>	<u>Watershed</u>		<u>Water Problem Area</u>	
	<u>Acres</u>	<u>Percent</u>	<u>Acres</u>	<u>Percent</u>
Forest land	13,164	62	11,841	69
Cropland	6,290	30	3,836	23
Pastureland	715	3	673	4
Urban & built up	690	3	552	3
Miscellaneous	460	2	152	1
Total	21,319	100	17,054	100

Land in the water problem areas is used for production of corn, tobacco, soybeans, vegetables, beef cattle, and forest products.

Principal characteristics of streams in the watershed are as follows:

<u>Stream</u>	<u>Length (miles)</u>	<u>Bottom Width (feet)</u>	<u>Bank Side Slope</u>	<u>Channel Depth (Feet)</u>	<u>Channel Bottom Material</u>	<u>Channel Type</u>	<u>Flow Charac- teris- tics</u>
Big Branch <u>1</u> /	1.3	10-20	1:1	3-4	organic silt & fine sand	N	I
Mill Branch (313+00 to 347+00)	0.6	4-8	1:1	2-3	sand	N	I
Mill Branch <u>1</u> / (347+00 to Big Branch)	1.8	8-12	1:1	3-4	sand	N	I
Bear Branch <u>1</u> / (Lake Lure to Hurricane Cr.)	0.5	4-8	1:1	2-4	silty sand	O	I
15 M (171+00 to 174+00)	0.1	4	0.5:1	2	sand	M	E
33 M (285+00 to 313+00)	0.5	8-10	1:1	2	sand	M	E
35 M (250+00 to 313+00)	1.2	4-10	1.5:1 to 2:1	1-4	sand	M	E
5 R (388+00 to 423+00)	0.7	2-4	2:1	3-4	sand	M	I

All others - no defined channel

1/ Not in water problem area.

Legend:	<u>Channel Type</u>	<u>Flow Characteristics</u>
	M - Man-made ditch	E - Ephemeral
	N - Natural Channel	I - Intermittent
	O - None or practically no defined channel	

With the exception of man-made ditches and about 0.6 miles of Mill Branch, located about 2,000 feet downstream from Highway 32, stream

channels in the watershed are poorly defined or non-existent. Vegetation along watercourses generally consists of pure pine stands or pine with mixed hardwoods with an understory of gallberry, myrtle and other brushy species. An exception to this is the lower reaches of Mill Branch and Big Branch where hardwoods are the predominant vegetation.

In addition to streams, about 23 ponds are present in the watershed. These ponds range in size from one to 59 acres, and collectively cover 156 acres. Wells provide a dependable source of water for farm, household, and municipal use.

The major watercourse, Mill Branch, originates in the northwestern edge of the watershed and extends in a southeastern direction for a distance of approximately 11 miles to its confluence with Rigdon Branch. From this point for a distance of 3.5 miles to Little Hurricane Creek, the stream is called Big Branch. No water quality classification has been established for streams in the watershed. The University of Georgia made an analysis of water quality in Hurricane Creek at a point about one mile from the watershed in December 1972. The results of this analysis were as follows: Temperature 16 degrees C; dissolved oxygen 8.2 mg/l; pH 5.5; color 140 P-C units; total iron 0.45 mg/l; turbidity 25 JTU; alkalinity 5 mg/l; and hardness 15 mg/l. Total N, NO₃ and PO₄ were at levels below the instrument's detection capability. The Hurricane Creek and Mill Branch drainage area characteristics are quite similar except for size. Present annual suspended sediment in water flowing from the watershed is about 38 mg/l.

There is no mining activity of importance in the watershed. Ground water is available in ample quantities and of acceptable quality for domestic and industrial use. The city of Alma has a municipal water system with a pumping capacity of two million gallons per day. Sources of supply for the system are three deep wells that penetrate the principal artesian aquifer underlying the southeastern coastal plains of Georgia. Total yield of the three wells is approximately 1,500 gallons per minute. County residents are dependent upon individual wells for domestic supply.

The wetlands as defined in "Wetlands of the United States", Circular 39 published by USDI Fish and Wildlife Service, was used to reclassify the wetlands that were in the watershed in January 1976. There are 4.5 acres of Type 3, 20 acres Type 4, 15.4 acres Type 5, 48.5 acres Type 6, and 703.7 acres Type 7.

There is one area, approximately 112 acres, of Type 7 that was created by an old dam that keeps shallow water over part of the area for a considerable length of time during most years. Dominant plant species are swamp black gum, bay, and cypress in the interior with pine, myrtle, and shrubs around the edges.

Upland agricultural plant communities consist of widely dispersed fields of agronomic crops common to the area. These include corn, soybeans,

tobacco, and vegetable crops. Corn is the most important crop. Approximately 58 percent of the upland is used for these crops. Average size of fields is 25 acres. Virtually all farms include upland forest tracts averaging 10 acres in size. These forested tracts are well dispersed and intermingled with cultivated land and pastureland.

Lowland fields used for cultivated crops average 35 acres in size. These fields are also well dispersed and intermingled with lowland forested tracts which average 150 acres in size. Two large tracts of lowland forest are also generally surrounded by agricultural lands. These tracts of approximately 500 acres each are located north of the confluence of Hog and Mill Branches and just below the last farm pond on the main stem of Mill Branch.

The forest types are primarily pine and pine mixed with wetland hardwoods. Nearly pure hardwood stands occur along some of the main drainageways. Pine plantations are numerous and scattered throughout the watershed. The principal pine species are slash, longleaf, loblolly, and pond pines. The principal hardwood species are water and willow oaks, sweetgum, yellow poplar, red maple, black gum, and a variety of minor species associated with these types.

Brief descriptions of three of the most common non-agricultural plant communities that are easily recognizable and their relationship to the ecosystem of which they are a part are as follows:

1. Slash and loblolly pine trees are growing mostly on land formerly cultivated. These areas provide income to the owners and furnish escape cover and solitude for some species of wildlife. For the first few years after planting, greenbriers, blackberry plants, common lespedeza, beggar lice, and a host of other plants provide food and cover for birds and animals. As the trees grow larger, this understory of plants is lessened to various degrees dependent upon site condition and uniformity of tree stands. Management practices now employed such as rotation harvest followed by mechanical site preparation prior to replanting, prescribed burning, and control of excess water, all stimulate reproduction of many grasses and legumes essential to the welfare of many living things. This type of plant community represents approximately 95 percent of the upland forest.

2. Mixed stands of predominantly slash, loblolly, and pond pines with scattered cypress, sweet gum, water oaks, willow oaks, yellow poplar, red maple, and black gum with an understory of gallberry, palmetto, and myrtle are located at lower elevations than most pine plantations and agricultural land. Most of this type of plant community is on land too wet for productive timber stands of good quality. Generally, the low productivity and limitations imposed by wet soils discourage management and even fire which Odum describes as an ecological tool of great value

when properly used on forest lands.^{6/} These plant communities, which constitute a major portion of the forest land problem areas, occur in the upstream reaches of the watershed and along drainageways. Most project channel construction will be in or in close proximity to these areas, since they are slightly lower in elevation than most agricultural land also in need of protection. The larger of these areas are referred to locally as pine flats. Pine and hardwood species prevalent in the area and understory growth show a remarkable increase in productivity and quality with minimum water control measures installed.

These non-agricultural plant communities are too wet in their natural state to provide worth-while economic returns in forest products or to grow wildlife food in quantity and variety. In this watershed, these plant communities can be identified as transition areas upstream from or at slightly higher elevations than predominately hardwood areas. These areas do provide low value wildlife habitat for most native species. A potential exists for improving this habitat for some species of wildlife and for production of hardwood and pine forest products.

3. Predominantly hardwood stands occur along the frequently flooded lower reaches of Big Branch, Mill Branch from State Highway 64 to its confluence with Big Branch, and the lower reaches of Rigdon Branch. Principal species in these stands are red maple, blackgum, bay, some water oak, and scattered pines. These thickly forested areas of predominantly water tolerant tree species are below the outlets for proposed channel work. These areas show no ill-effects from the wide range of periodic floods experienced.

Present and Projected Population

Based on OBERS^{7/} information, the population of the watershed is expected to increase from the current 2,750 to approximately 3,900 by the year 2020. Approximately 350 members of a minority race reside in the watershed. Incomes of about 875 watershed residents are classed as low.

Economic Resources

The agricultural economy of the watershed derives from full-time family type operations. There is no federal land within the watershed. The state has a small acreage in road rights-of-way. Local government facilities and schools occupy relatively few acres. All of the forest

^{6/} Eugene P. Odum, "Fundamentals of Ecology," W. B. Saunders Company, 1971, pp. 131-137.

^{7/} "OBERS Projections, Economic Activity in the United States," Volume 2, BEA Economic Areas, (Based on the SERIES "C", Projected National Population, Bureau of the Census, 1967), U.S. Department of Commerce, September 1972.

land is in private ownership; large industrial companies own approximately 1,800 acres, and the rest is in small holdings.

The major farm products are poultry, beef, and row crops. There are 179 landownerships (averaging about 115 acres in size) distributed throughout the watershed. Census-defined farms average 184 acres in size. Approximately 84 percent of the farms within the project are owner-operated, and 16 percent are tenant operated. About 60 percent are full time and 40 percent are part time farm operations.

The major crops grown are corn, soybeans, tobacco, and vegetables. Vegetables account for a minor portion of farm sales, but they are important to each farm family as a food source. Corn and soybeans comprise 95 percent of the cropland acreage, and corn yields average eighty bushels per acre. Soybean yields are about 20 bushels per acre. Tobacco, which makes up four percent of the cropland acreage, has an average yield of 2,200 pounds per acre. Vegetables account for one percent of the cropland acreage. The primary vegetable crop is sweet corn with yields of about 500 dozen ears per acre. In the problem areas, under present conditions, field corn yields about 60 bushels per acre, soybeans yield 16 bushels per acre, and tobacco yields 1,800 pounds per acre. The average pasture yield is 300 pounds of beef per acre, but in problem areas the yield is only 200 pounds per acre.

According to local officials, the value of agricultural land depends upon several factors: location, crop allotments, soil types, and severity of excess water problems. The estimated value of Class IIw land is from \$250 to \$300 per acre; IIIw, \$200 to \$250 per acre; IVw, \$80 to \$130 per acre; and Vw, \$40 to \$60 per acre. The value of a lot within the city limits of Alma is estimated to be \$1,500.

Transportation facilities within the project area consist of an excellent system of state and federal highways and county farm-to-market roads. Georgia Highway 32 traverses the watershed in an east-west direction. Georgia Highway 64 and U.S. Highways 1 and 23 cross the project in a north-south direction.

The sale of crops including nursery products and hay accounts for 32 percent of the farm income. Livestock and poultry products account for 65 percent, and horticulture and forest products account for 3 percent.

Off farm employment opportunities within the project area is very limited. Agricultural employment in Bacon County is steadily declining because of advancing technology which causes a decrease in the demand for labor. Conversely, non-agricultural employment is steadily increasing. These trends are exhibited in the following tabulation labeled Average Annual Work Force Estimates (Bacon County). Some employment opportunities can

be found in nearby Waycross and Douglas which are within a reasonable commuting distance. The unemployment rate for Waycross (3.5 percent) and Douglas (3.2 percent) is below the state average (3.7 percent) which indicates that unemployment in these cities is not serious. The following tabulation exhibits that during this same period the county unemployment rate was 2.7 percent.

Average Annual Work Force Estimates (Bacon County)^{1/}

<u>Employment Status</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
Civilian work force	2,980	3,050	3,010	3,000
Employed	2,890	2,940	2,900	2,920
Agricultural	630	550	510	510
Non-agricultural	2,260	2,390	2,390	2,410
Wage and salary, except domestic	1,780	1,910	1,910	1,930
Unemployed	90	110	110	80
Unemployment rate	3.0	3.6	3.7	2.7
State Average	2.9	3.6	3.9	3.7

^{1/} "Georgia Annual Average Work Force Estimates By Area, 1969-1972," May 1973, Georgia Department of Labor, Employment Security Agency, p. 7.

The 1970 Bacon County per capita income of \$2,311 was 31 percent below the state average and 41 percent below the national average. The median income of \$5,323 was 35 percent below the state average.^{8/}

Data from the 1969 Census of Agriculture shows that the average age of farmers in the project area is 48.7 years. There are 25 farmers under 35 years of age. Of these, 5 are under 25 years of age. These statistics indicate that the family farms are under father and eventually son management.

The watershed is located in a designated Rural Development Area, and it is eligible for all programs under the Economic Development Administration. The watershed is also included in the Alma-Bacon County Model Cities Program. It is also in the area administered by the Southeast Georgia Area Planning and Development Commission.

Plant and Animal Resources

Data for the Fish and Wildlife Resources for the Mill Branch Watershed was derived from the Field Study Report made in April 1970 by the USDI, Fish and Wildlife Service.

^{8/} "County and City Data Book, 1972," U.S. Bureau of the Census, U.S. Printing Office, Washington, D.C., 1973, Library of Congress Card No. 52-4576.

Wildlife habitat in Mill Branch Watershed generally is of low quality. Practically all of the cleared land is being used by landowners who practice clean till farming. As a result, food and cover in the fields are scarce, and edge-type habitat is minimized. Forest cover on the upland is primarily pine, usually even-aged in varying size tracts. Where there is an understory, it is composed primarily of gallberry and myrtle. Areas that remain wet because of topography or poor internal drainage are characterized by cypress, gum, and bay. These same tree species are found along the stream courses with other woody and herbaceous growth. Undergrowth along the stream courses is well developed in most places. Game abundance and hunting pressure within the watershed are low. However, habitat quality could be improved through management.

Most species of game and non-game wildlife common to the Coastal Plain are present in the watershed. The most common of these are opossum, raccoon, cottontail rabbit, fox squirrel, gray squirrel, gray fox, bobcat, whitetail deer, muskrat, wood duck, bobwhite, mourning dove, common crow, and vulture. Numerous species of songbirds, small animals, amphibians and reptiles are indigenous to the area.

Wood duck and other common aquatic-type wildlife are present in the 112-acre area previously described as Type 7 wetlands (U.S. Fish and Wildlife Circular 39). To a lesser extent, these species use the constructed farm ponds and intermittent streams.

Most ground feeding species of animals and birds feed on corn and soybeans after machine harvest. Various birds, squirrels, raccoon and opossums feed on immature ears of corn in late spring and summer. This food supply is readily available throughout the upland and lowland agricultural plant communities due to interspersed areas.

Hardwood and mixed pine plant communities provide habitat for fox squirrel, rabbit and other species. This type habitat is used by most species common to the adjoining agricultural plant communities.

Deer, raccoon, gray squirrel, opossum and other species inhabit the hardwood plant communities along the streams in the lower reach of the watershed. This habitat is also within a reasonable distance from the agricultural plant communities.

No endangered or threatened species of wildlife were identified by biologists who studied the watershed and prepared reports.

Watershed fishery resources are of low value. There are a number of impoundments on the main stem of Mill Branch which offer some fishing opportunities. There are also a number of "woods ponds" that are utilized by sport fishermen to a limited degree. Fishing success is poor in the impounded areas. Stream fishing apparently is restricted to road crossings from State Highway 64 downstream. Above this point the main stem base flow is quite small and tends to go dry during summer

months. Although stream fishing pressure is low to negligible, Mill Branch and Big Branch are used for spawning and recruitment of fish for the stream to which it is tributary.

From the vicinity of Highway 64 downstream to the end of the watershed, a seasonal stream fishery of approximately seven and one-half miles exists. Although the stream is privately owned, three county road crossings provide some public access.

Fish species in the watershed include largemouth bass, bluegill, war-mouth, catfish, sucker, and many other species of lesser importance indigenous to the area.

Recreational Resources

The State Comprehensive Outdoor Recreation Plan (SCORP) completed for Georgia in 1971 included an inventory of recreation areas. Of the 18 recreation areas identified as existing in Bacon County, only one is located in the watershed. This one facility is a privately owned pond of 40 surface acres. It is open to the public for fishing on a fee basis. Of the 17 remaining areas outside the watershed seven are privately owned ponds and lakes. The remaining nine are neighborhood and roadside parks, education facilities, and similar non-water based facilities.

Future recreation developments are planned for the general vicinity. Those being planned under programs administered by other than the Soil Conservation Service include construction of the following: Lake Alma with a water surface area of 1,800 acres; Alma-Bacon County Community Recreation Area; Old Main Street (Linear Park); and eight neighborhood mini-parks. Major financial assistance will be provided by the Model Cities Program of the Department of Housing and Urban Development and the Bureau of Outdoor Recreation.

Existing recreational resources in the county are heavily utilized according to the State Comprehensive Outdoor Recreation Plan. Due to the relatively low income prevalent in the area, most residents spend their vacations at home and take advantage of local facilities. In the immediate vicinity, Hurricane Creek and Little Hurricane Creek provide some recreational opportunities; however, public access is limited. The Slash Pine Area in which the watershed is located includes the following major natural recreational opportunities within reasonable commuting distance: the Suwanee, St. Marys, Satilla, and Ocmulgee Rivers; the Okefenokee National Wildlife Refuge; and the Rocks. Several state parks are also available. The state has numerous boat launching ramps on the larger rivers, and excellent facilities are available at the state parks.

Archeological, Historical, and Unique Scenic Resources

There are no places of known archeological, historical, or unique scenic value in the watershed. The National Register of Historic Places indicates that there are no places of historic value in Bacon County. An archeological study performed by the University of Georgia, Department of Anthropology, specifically for this project did not identify any sites.

Soil, Water, and Plant Management Status

Agricultural census reports indicate that land in farms in Bacon County decreased from 118,335 acres in 1964 to 109,357 acres in 1969.

In the past, field crops have contributed a great deal to the percentage of total agricultural sales in Bacon County. The value of field crops in 1949 comprised 68.2 percent of all farm products sold. In 1969 field crops accounted for only 31.5 percent of all farm products sold (Census of Agriculture). This significant reduction was accompanied by the virtual disappearance of such crops as cotton. In 1951 there was a record high of 4,350 acres of cotton in Bacon County. In 1972 only 10 acres were planted.

Tobacco, an important cash crop, has remained practically the same from 1949 to 1969. Within the same time period, corn acreage increased 40 percent. This can be attributed to the conversion of corn from a feed for work animals to a versatile cash crop.

Soybeans, a relatively new crop in Bacon County, were first planted in 1965. For some time the acreage doubled each year.

In 1964, 27 farms within the county reported sales of broilers. In 1969, 43 farms had reported sales of broilers comprising 38.6 percent of all agricultural products sold in Bacon County. This made poultry and poultry products the number one enterprise in terms of total sales.

Within the last five years, the number of cattle has declined.

The following tabulation shows a comparison of farm sales of some of the most important agricultural commodities in 1949 and 1969.^{9/}

Value of Products Sold As Percentage of Total Sales

	<u>1949</u>	<u>1969</u>
	%	%
Field Crops	68.2	31.5
Forestry Products	18.1	3.2
Poultry and Poultry Products	0.8	38.6
Other Livestock and Livestock Products	12.3	25.1
Dairy Products	0.4	1.2
Vegetables	0.2	0.4

^{9/} "U.S. Bureau of the Census, Census of Agriculture, 1969" Volume 1. Area Reports, Part 28. GEORGIA, Section 2. County Data Appling Co., Jasper Co., Library of Congress Card No. 72-601370.

In this 20 year period there has been a significant reduction in the number of farms from 1,128 in 1949 to only 596 in 1969. The average size farm was 129 acres in 1949; and the average farm had 184 acres in 1969. The decline in the number of farms is a common trend in Georgia. The more efficient, larger farms tend to expand, and these progressive owners eventually buy out the smaller, less efficient farms. This accounts for the decrease in the number and average increase in the size of farms.

Yields from approximately 37 percent of the land used for production of agricultural and pine forest products are depressed due to the need for the control of excess water. A corresponding inefficiency in utilization of labor and capital results. Some landowners in Bacon County report a total loss of their tobacco crops in years with high rainfall during the critical growing season.

The Altamaha Soil and Water Conservation District in cooperation with the Soil Conservation Service is carrying out an active program of assistance to landowners in the following areas: conserving natural resources, conducting youth activities, assisting farmers with pollution abatement, and responding to the nation's call for more food production. Assistance has been provided to 100 landowners in development of soil and water conservation plans covering approximately 75 percent of the watershed. Approximately 65 percent of the planned conservation practices have been installed. Soil surveys of over 16,000 acres of the watershed have been completed.

The Georgia Forestry Commission in cooperation with the U.S. Forest Service through the various federal-state cooperative forestry programs, is providing forest management assistance, forest fire prevention and suppression assistance, distribution of planting stock, and forest pest control assistance to private landowners in the watershed area. These programs will be continued throughout the installation period of the project.

WATER AND RELATED LAND RESOURCES PROBLEMS

Land and Water Management

The most significant land treatment problem is the need for timely disposal of excess surface water from crop, pasture, and pine forest land. Saturated soil conditions create a very poor plant environment due to a lack of aeration. Mild winters and high rainfall and temperatures during the spring and summer create a problem in maintaining organic matter in some of the soils used for cultivated crops. There is a need for conservation practices such as wildlife habitat improvement, conservation cropping systems, crop residue use, minimum tillage, and water disposal systems on most cropland. At present, few landowners

have adequate outlets for water disposal systems within the confines of their farms. The risk of crop damage or failure from flooding and wet conditions is too great to permit full utilization of several conservation and cultural practices available that would benefit the community financially. Loss of revenue and low income is also responsible for some practices not being installed. Excess water problems in parts of fields and in many instances entire fields cause inconvenience and prevent full utilization of land, labor, and capital.

Grassland problems consisting of low forage yields and low quality reflect a need for pasture and hayland planting, management, and water control. Excess water drowns plants or reduces palatability and quality and causes a loss in grazing time. The end result is very poor yields of beef per acre in problem areas.

Floodwater Damage and Drainage Problems

Damage from flooding and damage from poor drainage in the watershed are inseparable. Problems of excess water occur on 2,587 acres of corn, tobacco, soybeans, and pastureland, and 2,828 acres of pine forest located on 153 farms. These farms are located primarily in the northwest, central, and southeast sections of the watershed. Values of crop and pastureland in the problem areas are approximately \$200 per acre, and forest land is valued at \$150 per acre. Due to inadequate storm sewers in Alma, four homes are subject to flood damage from a two year frequency flood. Most of the area subject to damage is in land capability Classes IIIw and Vw. Due to the nearly level topography and to the lack of outlets on individual farms in the problem areas, annual flooding occurs. Floodwater moves off slowly, and wet soil conditions prevail for extended periods. Planting dates are critical due to summer rainfall patterns, and delays often result in crop failure or depressed yields. Flooding and poor drainage reduce income and cause problems to landowners and operators in the following ways: (1) delaying planting; (2) sometimes damaging or destroying early planted crops to such an extent that replanting is necessary, resulting in added cost of additional land preparation, seed, and fertilizer; (3) depositing weed seed; (4) damaging crops and causing poor quality; (5) limiting grazing time and lowering forage quality; (6) causing plant disease; and (7) delaying and, in extreme cases, preventing harvest. These are ever present hazards since the watershed is sufficiently near the coast to experience torrential rains when tropical storms approach. These storms usually occur during the fall harvest season. Few average size farms have outlets for needed field ditches and subsurface drains within the farm boundary. This problem is the most difficult to resolve and is of great concern to the Sponsoring Local Organization and landowners. No programs other than PL-566 exist in sufficient scope to solve this problem. The predominant soils are well adapted to crops grown in the area and respond well when these drainage practices are possible. The economic plight of the small farmer is so well known that it is needless to mention his need for fully utilizing all resources at his disposal.

Roads are inundated by floodwater for long periods of time causing added expense and inconvenience to people who live in the watershed. School busses and other traffic have to be rerouted for several days until floodwater recedes and roads can be repaired. Road damage consists of dislodgement of culverts, undermining of bridge abutments, erosion of road fills, and softening of road beds. Repairing these roads accounts for a large portion of tax money that could be used more advantageously elsewhere.

Each tributary or lateral was considered to be an evaluation reach (Appendix B). An evaluation reach is a segment of a stream where the land uses, soil conditions, and yields are generally similar. Separate evaluation reaches were then combined into evaluation units. These evaluation units are the basic units in which project costs and benefits are measured and compared. (See Appendix A.) There are no significant differences in the problems associated with each reach.

Average annual damages by major categories are estimated as follows; crop and pasture, \$64,675; road, \$40,428; and pine forest, \$22,384.

No loss of life has been attributed to floods in the watershed. High water and generally wet conditions are largely responsible for insect pests that affect the well being of residents. Flooded or saturated field roads, driveways, yards, and gardens are responsible for inconvenience and general disruption of daily routines.

Tobacco, the highest value (per acre) cash crop, is especially vulnerable to wet soil conditions, and occasionally the entire crop is lost. Excess water during the growing season also adversely affects quality and reduces yields of tobacco crops by about 60 percent. Production costs are increased because of the under-utilization of resources and because farm machinery becomes bogged down in wet places.

Approximately 23 percent of the forest land is either poorly stocked or unstocked with desirable tree species because of excessive water. On portions of the near level coastal plains soils, extended periods of inundation and saturated soil conditions are serious problems to some forest landowners in the area. This condition results from both inadequate outlets to remove excessive water and from high ground water levels. Existing water courses in some areas are inadequate to remove excessive surface water and to reduce soil moisture in a period of time suitable for good growth and regeneration of timber stands or for ready access for management and protection.

Local efforts to improve conditions consist mainly of installing surface and subsurface drains in the relatively few instances where outlets are available within individual farm boundaries. The favorable results obtained by those fortunate enough to have adequate outlets for farm

drains are well known in the watershed, and landowners have indicated structural measures will be used principally as outlets for subsurface drains. Minimum tillage farming is growing in popularity in this area and when used in combination with subsurface drains, satisfactory yields and minimum loss of soil results. The principal soils used for crop production in the problem areas perform well under this type of management.

Erosion and Sediment Damage

Erosion and sediment problems in the watershed involve two distinct elements, gross erosion and subsequent sediment yield. Gross erosion results from those physical processes that allow soil particles to move from one location to another. Sediment yield is the amount of these soil materials which are delivered to the watershed outlet and become a part of the downstream sediment load.

Gross sheet and rill erosion from all sources amount to approximately 28,000 tons annually or the equivalent of 1.3 tons per acre. In this watershed, cropland is the largest potential source of erosion, while other land uses, such as pasture, forest land, urban land and isolated critical areas comprise less significant sources. The 28,000 tons of gross erosion consists mostly of those soil particles that are washed from high points in a field, moved a short distance, and deposited in various locations such as lower portions of fields, field ditches, and overflow areas such as vegetated field borders, forest land or wetlands. Only a small amount, approximately 1,000 tons, or 0.05 ton per acre per year, is delivered to the watershed outlet to become sediment yield.

The low sediment yield is a result of several factors. Relief changes are small with most of the land sloping an average of 1 to 2 percent. The more rolling topography averages from 2 to 5 percent slope. The flat topography, low stream gradients and densely vegetated field borders and drainage courses restrict the quantity of sediment that enters the channels and outlets. Typical soil particles are sufficiently large to be quickly deposited when vegetation is encountered.

Erosion and sediment damages were found to be insignificant and were not evaluated. The lack of channels in the wide, flat drainageways is a natural geologic feature of the flatwoods resource area and not a result of recent sediment fill. No scour damage has been observed.

Irrigation

Due to the high rate of rainfall which is normally adequate or excessive during the growing season, few farmers are using supplemental irrigation. Water from several small ponds and pits is used for such high value crops as vegetables and tobacco. Soils are well adapted to sprinkler-type irrigation during periods of drought, but very few impoundment sites are available. The ground water resource is adequate if supplemental irrigation becomes a widely used practice in the watershed.

Municipal and Industrial Water

Alma has adequate supplies of underground water for the foreseeable future. Hurricane Creek and Little Hurricane Creek are also nearby if additional supplies are ever needed. However, these streams would not be reliable in dry periods.

Recreation

No suitable impoundment or stream oriented sites for water based recreation exist in the watershed. The proposed Lake Alma, and associated recreational developments should fulfill the need for this type recreation. The existing ponds provide some fishing opportunities. However, they are privately owned and some are not open to the public. Others can be fished on a fee basis.

Plant and Animal Problems

The poor quality of fish and wildlife values in the watershed was described under the Fish and Wildlife Resources section. To improve the game habitat the following practices are needed: food and cover plantings, prescribed burning of woodlands, and the establishment of several species of oaks such as water oak, laurel oak, and sawtooth oak.

Few pond sites exist in the watershed; therefore, opportunities for improving the fisheries resource consist mainly of improving management of the few existing ponds. The stream fishery is limited by the lack of depth and the intermittent nature of flow. This low value fishery with limited public access is located downstream from Highway 64 (APPENDIX B). Although fishing pressure is low to negligible, the stream is used for spawning and recruitment of fish for the stream to which it is tributary.

Economic and Social

According to the 1969 Census of Agriculture, for Bacon County, 6 percent of the commercial farms had gross sales of less than \$2,500, 19 percent less than \$5,000, and 21 percent less than \$9,000. When production costs and family labor are considered, net profits are extremely low. These county statistics are representative of the situation within the watershed.

The watershed is located in an economically depressed area which is eligible for federal programs of assistance designed to help such areas. The Alma-Bacon County Model Cities Program is designed to improve the living standards of inhabitants of the area. The entire watershed is located in this Model Cities Program area. There is a need for additional agricultural enterprises and/or more off-farm employment opportunities to supplement low incomes of most family farms. Approximately 20 percent of the water problem area is located on farms using one and one-half man-years or more of hired labor.

The recent depletion of food reserves in the nation supports the need for promoting rural community development in this and other similarly depressed areas. The need for reduction of floodwater and poor drainage damages to roads, crops, pasture, pine forest, and gardens is obvious. Increased production of needed crops and economic stimulation from additional jobs, sales, and purchases are also needed. The Cooperative Extension Service recognizes the need for rural development in Bacon County and is actively cooperating with the Model Cities officials in promoting additional activities designed to improve living standards and to make farming more attractive and profitable. The low per capita income (shown under Watershed Resources - Environmental Setting) demonstrates further the need for improvement of the local economy.

Other

Since watershed streams are intermittent or ephemeral, wells and ponds are relied upon for livestock and general farm use during periods of low rainfall.

RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

The proposed project does not conflict with any known approved or proposed federal, state and local use plans, policies and controls.

ENVIRONMENTAL IMPACT

Conservation Land Treatment

The planned conservation land treatment program will reduce gross erosion from approximately 28,000 tons annually to 17,000 tons annually, a reduction of 11,000 tons. Sediment yield will be reduced from 1000 tons (0.05 ton per acre) to 900 tons (0.04 ton per acre) annually. This 100-ton annual reduction is less than one percent of the total annual sediment yield for the Satilla River Basin. The present annual average of 38 mg/l of suspended sediment in waters flowing from the watershed will be reduced to 34 mg/l.

Productive capacity of the soil will also be improved, and the protected soil resource will continue to provide food and fiber for future generations. The general appearance of the landscape will be enhanced.

Improved management of the 23 existing and installation of the 2 proposed farm ponds will provide needed water for farm use and outdoor recreation. A habitat for fish, aquatic wildlife, and shorebirds will be created. Upland game habitat will be enhanced by 150 acres of food and cover plantings. Song birds and other non-game wildlife will also have access to these areas.

Improved land use will allow more efficient use of farm resources and this will result in more economical and profitable farm operations. The accelerated emphasis on assisting landowners and operators to plan and apply proper conservation measures on approximately 170 farms will result in increased income and more effective use of land, labor, equipment, and other capital assets.

The proposed forest land treatment measures will significantly improve the condition and productivity of the forest lands. Good water management and forest management with continued protection from fire, insects, and disease will combine to increase natural regeneration and tree growth and will increase the accessibility of the forest land for management.

The water control level recommended for the forest land is such that the impact upon water yield characteristics would be small. The project may cause reduced peak flows if it has increased the available soil storage at the time of precipitation. If the water table is at the surface, the areas may yield surface runoff more rapidly.

Where water control is needed, the system will be designed to facilitate the removal of excess surface water only. The greatest impact on the ground water table will come about through transpiration of the improved stand of trees. The low level of water control needed on the forest land to accomplish the benefits pointed out in this plan will have a minimal impact on the quite limited fishing and waterfowl resources. Small game is usually benefited by programs of this nature. Removal of surface waters in the forest results in a change in the low-growing types of vegetation. Native plants expected to become established on these formerly saturated forest soils include seed, fruit, and browse producers which are attractive to small and large game species and many non-game species. Feed for small game and non-game wildlife is expected to increase with this addition of a food supply to the natural forest cover. The development of more productive forests will provide greater quantities and better quality fiber for industry, recreation opportunities, aesthetic pleasure, forage use, and forest animal habitat. The hydrologic condition of the forest soils will be improved.

The owners of the area of approximately 112 acres of Type 7 wetland will be encouraged to manage it more intensively as a part of the conservation land treatment program. The area located one mile southeast of Alma has an old man-made dam that could be modified to facilitate manipulation of water levels to allow plantings and subsequent flooding for waterfowl enhancement and hardwood production.

Landowners are expected to construct approximately 2 additional farm ponds with a total surface area of about 6 acres. During the course of rendering technical assistance to landowners in planning and applying conservation land treatment, emphasis will be placed on management of these new ponds and existing ponds for fee-fishing enterprises with adequate sanitary waste disposal facilities.

It is expected that open surface water for wildlife purposes will be more plentiful in dry periods as a result of the project since experience has shown that constructed canals in pine and agricultural flat land will contain water most of the time. These flats are subject to periodic flooding and saturated soil conditions, but few if any areas hold surface water for extended periods. Aquatic species of wildlife that associate with aquatic ecosystems, will be expanded by the water-holding characteristics of constructed channels. Under present conditions, the USGS stream gage on Hurricane Creek 1.5 miles north of Alma records no flow at times each year even though the drainage area is approximately 150 square miles.

Structural Measures

Structural measures will replace approximately 44 acres of forest land and 7 acres of cropland valued at approximately \$150 and \$200 per acre, respectively. In addition to the loss of production of forest products and agricultural commodities from these areas, forest land habitat for wildlife will be reduced by 44 acres. This habitat will be replaced by an intermittently flowing stream providing, at first, a low value habitat for water oriented creatures. As the channel continues to age and accumulate more vegetation, this habitat will improve. Generally low quality forest land wildlife habitat will be degraded by the clearing of approximately 211 acres for construction rights-of-way. Disturbed areas will be vegetated immediately after construction, and oaks and other species of trees useful for wildlife food will be planted. This treatment will eventually restore and even improve habitat for some wildlife including deer, squirrel, rabbit, fox, raccoon, opossum, quail, reptiles, and songbirds. Habitat for life forms adapted to saturated soil conditions will be degraded due to creation of a less wet condition.

A hydrologic analysis of downstream effects of the project reveal that the Mill Branch and Big Branch forested flood plain at the project outlet is more than adequate in cross section to contain increased flood stages. Increases in the storm runoff water surface elevations vary as shown below:

<u>Frequency of Occurrence</u>	<u>Change in Water Surface Elevation</u>
1-year	+ 0.3 foot
2-year	+ 0.3 foot
5-year	+ 0.3 foot
10-year	+ 0.2 foot
50-year	+ 0.2 foot

By installing channels, where none existed previously, it can be expected that some erosion with increased water turbidity will occur during and immediately after channel construction. However, it is anticipated that this eroded material will be accommodated in sediment traps to be installed along channel reaches. Wide, flat, thickly vegetated areas in the lower reaches of the project will also act to filter sediment and to oxidize

any other pollutants that may reach the area. An aging process of 6 to 12 months will be required for the establishment of vegetative cover during which time disturbed areas will be stabilized. Native vegetation such as annual weeds will also contribute to the stability of disturbed areas.

The 40 acre recreational pond identified as the only facility in the watershed is located one mile downstream from channel work. The sediment trap and the undisturbed area between the planned work and the recreational pond will minimize any construction induced turbidity. Other existing and proposed recreational areas are located away from channel work and will not be affected. The proposed Lake Alma, which is outside the watershed area, will not be affected.

Water quality data published by the Department of the Interior, Geological Survey for the Satilla River 3 miles north of Waycross indicated fecal coliform contents ranging from 30 to 2,300 MPN; biochemical oxygen demand from 0.9 to 1.6 mg/l; turbidity 4 to 5 JTU; pH 4.7 to 6.1; dissolved oxygen 5.3 to 10.1 mg/l; temperature 10 to 25 degrees C; phosphate 0 to 0.24 mg/l; nitrite plus nitrate 0 to less than 0.02 mg/l. Testing was carried on from October 1970 to September 1971. The drainage area at the gage section is approximately 1,200 square miles of land quite similar to the Mill Branch Watershed area. Farm drainage systems have been installed on much of this 1,200 square mile area.

The Mill Branch drainage area (33 square miles) is considered typical of the many contributing drainage areas of the Satilla River above the gage station. The gage is about 25 miles downstream from the project. The Department of Housing and Urban Development arranged for a water quality analysis to be made by the University of Georgia at several locations on Hurricane Creek much nearer the watershed. At U.S. Highway No. 1, about one mile from the Mill Branch watershed boundary, water quality on December 10, 1972 was as follows: temperature 16 degrees C; dissolved oxygen 8.2 mg/l; pH 5.5; color 140 P-C units; total iron 0.45 mg/l; turbidity 25 JTU; alkalinity 5 mg/l; and hardness 15 mg/l. Total N, NO₃ and PO₄ were at levels below the instrument's detection capability. The drainage area above the test site is about 150 square miles.

No wetlands of high value to wildlife will be affected by the project structural measures.

Production from the cropland and forest land to be occupied by channels will be lost. Forest land wildlife habitat will also be lost on 44 acres; however, as the channel vegetation improves, a habitat for various other life forms will develop. Loss of forest land wildlife habitat on 211 acres to be cleared for rights-of-way will be temporary.

All evidence derived from the archeological study indicates that the proposed project will not adversely affect any cultural resources in the Mill Branch Watershed.

Planned levels of protection (PROJECT PURPOSES AND GOALS) will allow removal of excess surface water in sufficient time to prevent damage to approximately 2,828 acres of pine forest and 2,587 acres of agricultural land located on 153 family-type farm units. Approximately 505 watershed residents will be directly benefited by the structural measures from an agricultural and forestry production standpoint. Most of the approximate 2,750 residents are expected to benefit from a reduction of floodwater-type mosquito breeding areas. Residents of the county will benefit from reduced road maintenance costs.

Landowners and the Sponsoring Local Organizations do not anticipate nor do they desire land use changes as a result of the project other than that land which will be utilized in construction rights-of-way. No benefits were calculated for bringing new land into production.

Reduction of the excess water hazard will allow greater freedom in selecting conservation rotations. Better management practices will be possible resulting in higher yields of improved quality products.

Removing excess surface water from the forest land could increase the hazard of wildfires. However, prescribed burning of pine forests for hazard reduction at intervals of from three to five years is a standard forest management practice in the area. A shift to a less wet condition on the improved forest area will allow more effective prescribed burning at intervals which will reduce the probability, size, and intensity of wild fires. Prescribed burning is also desirable for reducing air pollution associated with wild fires and improving vector control and game habitat.

Drainage outlets for an airport and industrial park will be improved by agricultural and forestry channels traversing the area.

Project channels will provide better outlets for existing culverts within the watershed thereby reducing maintenance costs at stream crossings. Some 42 locations will directly benefit with approximately \$28,300 in benefits being derived from reduced maintenance. Alma airport will be benefitted as the project channels will provide better drainage thereby making mowing and other maintenance operations easier.

Economic and Social

Installation of this project will generate additional income in the form of increased man-hours needed to harvest and process the increased amounts of forest and agricultural products. Improved growth, access, and regeneration will provide an average annual net increase in returns of approximately \$11.00 per acre from protected forest land. Planned conservation measures will permit an increase in beef yields from about 200 to 450 pounds per acre; corn from 60 to 120 bushels per acre; tobacco from 1,800 to 2,200 pounds per acre; and soybeans from 20 to 30 bushels per acre. Vegetable crops will show an even greater increase in yields than the regular field crops.

Project improvement will allow much quicker removal of standing water in yards, gardens, and lots. Direct favorable effects should be immediately apparent in relieving some floodwater-type mosquito problems by removal of floodwater prior to development of mosquitoes. About 90 percent of the mosquito problem in the Coastal Plain is caused by floodwater types.

The economic plight of low income families residing on small tracts of land will be improved by the availability of outlets for disposal of water from vegetable gardens and yards. Some insight into their poverty level can be derived from the fact that per capita income in Bacon County is only \$2,311. This is about 59 percent of the national level. Out of economic necessity these less advantaged people live in the wettest areas where it is hard to grow good crops of vegetables and to have suitable pastures for livestock. Increased yields of better quality vegetables where low income residents have an urgent need for improved diets will be possible after the project is installed.

Forest land soils within the zone of influence of proposed project channels are not suitable for agronomic crops. Damage reduction and improved efficiency benefits to the existing land are sufficient to justify the project from an economic standpoint. Damages to agriculture and forest land will be reduced by 70 percent.

Growth, access, and regeneration on 2,828 acres of forest land will be directly improved. Many of these acres are not presently producing economic returns. More effective management and protection of these areas will be possible. Installation of this program will generate further income in the form of increased man hours needed to harvest and process the increased amounts of forest products. Habitat for some species of wildlife will be improved by the change to a more diverse and palatable ground vegetation.

Although some industry has recently located in Alma and more is expected as a result of efforts by the Model Cities Program, the local economy is largely based on agricultural production and processing. The Model Cities Program administrators in cooperation with the Cooperative Extension Service and others are introducing new agricultural enterprises that will be enhanced by removal of the flood hazard.

A considerable volume of corn, the most important crop grown in the watershed, is used in producing hogs, cattle, and poultry; some of the corn is being fed as silage. The increased production of corn resulting from the project is expected to be utilized locally. Georgia produces only a small fraction of corn and other feed grains needed by farmers in the state.

The project is compatible with the Plan for Development of the Land and Water Resources of the Satilla-St. Marys Basins developed by the United States Study Commission. The project will contribute to the achievement of objectives contained in the Basin Plan in the fields of flood prevention, drainage, soil conservation and utilization, forest conservation and utilization, public health, and sediment control.

Increased agricultural production that will accrue due to project installation will create new demands in agriculturally related businesses. An estimated additional \$34,000 will be spent annually for farm supplies. An additional \$23,700 will be spent annually for harvesting and marketing services. An additional 1,040 man-days of seasonal labor will result from increased agricultural production.

Approximately 2.8 skilled and 22.5 semi-skilled jobs will be created by funds spent during project installation, and 7.9 permanent skilled and 15.8 permanent semi-skilled jobs will be created as a result of direct project benefits. In addition 1.7 permanent semi-skilled jobs will result from operation and maintenance of project measures. Creation of these new jobs will help stem population decline in Bacon County.

Floodwater reduction and drainage will improve living conditions. Better farm outlets for floodwater and drainage will; improve efficiency of agriculture by insuring timely planting, help eliminate the need for replanting, thereby reducing production costs, insure timely harvest of crops and forest products, and provide accessibility to forest areas for management. The project will provide for less frequent interruption of traffic, and it will also reduce the need for road repairs. Funds previously needed for repairs can be used for other things that improve the quality of life. Eliminating these inefficiencies will increase incomes and make the entire area a more desirable place in which to live.

Project action will not adversely affect those limited recreational opportunities that have been identified within the project.

Some other effects of the project which were not evaluated monetarily are as follows: (1) increase in efficiency of farming and increase in value of land resulting from application of accelerated conservation land treatment programs; (2) increase in incidental drainage benefits to the municipal airport and industrial park; (3) reduction of floodwater-type mosquito breeding areas; (4) increase in food and cover for some species of wildlife by specific plantings and provide drinking water for wildlife over a wider area than now exists during periods of drought in project channels; (5) supplementation of existing ponds through pond construction and management which will assure continuous restocking of streams with escape fish; (6) increase in wildlife preferred food plants such as blackberry, smilax, oak, ragweed, and partridge pea which experience has shown begins to grow along immediate area of canal installations; (7) reduction of flooding in quail nesting areas; (8) improvement of conditions around rural homes; (9) increase in efficiency of equipment used in harvesting and regenerating forest stands, and (10) stimulation of wildlife food and cover plants through prescribed burning of pine forestlands.

Favorable Environmental Impacts

1. The annual rates of gross erosion and sediment yield will be reduced by approximately 11,000 tons and 100 tons, respectively. Aesthetics of the area and farming efficiency will be improved.
2. Ponds will be managed more efficiently for fish production and family recreation.
3. Approximately 5,415 acres of agricultural and pine forest land located on 153 farms will be protected, thereby reducing damages by 70 percent annually. Additional benefits will be attributable to improved efficiency and more intensive land use.
4. Annual maintenance cost of secondary roads will be reduced by \$28,300.
5. Wildlife habitat on 150 acres will be improved by planting food and cover plants.
6. Floodwater-type mosquito populations will be reduced.
7. New jobs will be created and the local economy stimulated.
8. Reducing excess surface water will allow prescribed burning of pine forest land, which in turn will reduce the probability, size, and intensity of wildfires with associated air pollution. Vector control and wildlife habitat is improved by prescribed burning.
9. The reduction in average suspended sediment of 4 mg/l annually will improve surface water quality by reducing turbidity and attendant pollutants.

Adverse Environmental Effects

1. Approximately 7 acres of cropland and 44 acres of forest land will be replaced by project channels.
2. Forest land wildlife habitat on 211 acres will be degraded by clearing rights-of-way.
3. A shift to a less wet condition on improved pine forest areas may increase the fire hazard in areas where prescribed burning has not been done.
4. Water quality in intermittent and ephemeral streams will be temporarily degraded during and immediately following construction.
5. Approximately 6 acres of forest land will be replaced by farm ponds expected to be constructed by landowners.

ALTERNATIVES

1. Accelerated conservation land treatment. This alternative consists of those practices and measures described previously under the heading of "Planned Project - Land Treatment" with the following exception: Conservation Land Treatment will be limited to management of cropland, pasture, and forest with minor excess water problems. Practices for control of excess water will be reduced to those having existing suitable outlets. Impacts from this alternative would be similar to those described for the land treatment portion of the proposed plan. Flood damages would be reduced approximately one percent. Water quality in the intermittent and ephemeral watercourses would be improved. Adverse impacts resulting from the irreversible and irretrievable commitment of land to structural measures would be eliminated. Cost of this alternative is estimated to be \$341,500.
2. Accelerated conservation land treatment with excavation on laterals and pumped outlets into leveed mains. Conservation land treatment practices would be applied as referred to in alternative 1. A major portion of the flood plain of Mill Branch, Little Bear Branch, Rigdon Branch and main tributaries would be diked and 27 pumping stations installed. The dikes would replace 115 acres of agricultural and forest land and 78 acres would be required for approximately 535,000 cubic yards of borrow material. The borrow area would be replanted in trees, and dikes would be planted in grasses and legumes. Flood stages within the diked areas would increase compared to no project condition but duration of flooding would be expected to decrease. Levels of protection in areas served by laterals would be similar to that shown in the selected plan. Approximately 0.6 miles of natural channel on the outlet section of Mill Branch would probably remain unchanged. Wildlife habitat within the diked areas would remain virtually unchanged. Large quantities of fuel would be required to operate pumps on the larger drainage areas. Electrical energy would be practical for use in operating pumps on small drainage areas. Migration of fish into tributary flood plains during flood periods would be restricted. Turbidity of water in the main drainageways would increase during and immediately after pumping. The estimated installation cost of this alternative is \$2,563,000.
3. Accelerated conservation land treatment, flood proofing of fixed flood plain improvements, and public acquisition of water problem areas for uses more tolerant to excess water conditions. Conservation land treatment would be applied in accordance with alternative 1. Public road fills would be raised at approximately 60 locations. Public acquisition of approximately 5,415 acres of agricultural and pine forest land located on about 153 farms would be accomplished. Production of agricultural commodities would be curtailed and production of pine forest products would remain at present levels if the area was managed. Production would decrease

if public ownership preempted harvesting and management. Forest land wildlife habitat would remain in its present condition. Water quality would probably improve. The estimated cost of installing this alternative is \$4,318,300.

4. No project. The conservation land treatment program would continue at the present level provided funding of the Soil and Water Conservation District program and Rural Environmental Conservation Program continues. Assistance from other agricultural, forestry, and fish and wildlife agencies would also remain unchanged. Most landowners with the financial ability and with outlets on their land have installed some flood prevention and drainage channels. It is expected that relatively few additional measures can be installed without some type of cooperative project-type activity. Fish and wildlife habitat would likely remain unchanged. Also, little improvement of the human environment could be expected. Water quality in the intermittent streams in and immediately below the project would probably remain unchanged. Production of food and fiber and farm income would probably remain at or below current levels. Additional landowners may abandon farming as a result of excess water problems described in the sections entitled ENVIRONMENTAL SETTING AND WATER AND RELATED LAND RESOURCE PROBLEMS. The net annual monetary benefits that would be foregone by not implementing the project would be approximately \$137,100.

SHORT-TERM VS. LONG-TERM USE OF RESOURCES

The proposed project will enable local landowners and operators to apply improved management practices on approximately 9,890 acres of crop, pasture, and forest lands thereby increasing yields, controlling erosion and enhancing man's environment through long-term productivity. Based on trends and estimates of professional agricultural workers, cropland is expected to increase from 6,290 to 6,790 acres, pasture from 715 to 815 acres, urban from 690 to 990 acres, miscellaneous from 456 to 506 acres, and forest land shows a decrease from 13,164 to 12,214 acres. These estimated changes in land use are expected to occur in the distant future and not as a result of the project. No benefits contingent upon these land use change trends were calculated for project justification.

A major portion of land in this project is devoted to production of forest products. Many small subsistence type family farms have wood lots. Several large commercial companies manage their forests extensively. Virtually all these producers have one common problem---adequate outlets for disposal of surplus water are not available within the confines of individual ownerships. Except for relatively minor changes due to home sites, road construction and some urban growth that may occur, it is expected that most of the land will remain in timber production for the foreseeable future.

Water management on forest land in the coastal plain resource area, especially as it pertains to pine production, is of vital importance to the rural economy of south Georgia. Twelve large wood pulp mills in the coastal plain of Georgia and seven in north Florida utilize a major portion of 7,500,000 cords of mostly pine pulpwood harvested in Georgia annually. Two additional mills are under construction. There is a substantial need to increase production of the basic raw material to assure continuous operation of these mills which have a daily capacity of about 24,000 tons when available. Production from these mills enter national and world trade channels.

There are many other smaller manufacturing plants in the coastal area that are producing forest products such as lumber, plywood, utility poles and fence posts. The ready market for raw forest products along with land capability was duly considered in project formulation. Land-owners will benefit from planning conservation measures on approximately 4,800 acres of pine forest which is now producing below its capability.

Urban development in the distant future will benefit from the improved soil conditions and flood protection. The capacity for outdoor recreation will likewise be increased by the project.

The average watershed inhabitant believes that this project will enhance the environment both in the immediate and distant future.

The project was evaluated over a 100-year period and if properly maintained after this period it is expected to continue to provide benefits. Although Alma has some light industry and more may be attracted as a result of the Model Cities Program, it is likely that producing and processing agricultural and forest products will continue to be one of the most important economic activities in the distant future. The project is designed to be effective in meeting requirements for this long-term agricultural economy.

A brief summary of PL-566 activities in the 276,000 square-mile South Atlantic-Gulf Region is as follows: (a) authorized for planning, 347 projects, 35,670 square miles (13%), (b) approved for operations, 265 projects, 22,131 square miles (8%), and (c) completed, 64 projects, 2,890 square miles (1%). Subregion 6 has a drainage area of 37,000 square miles (12%), in which thirteen PL-566 projects have been installed. The total drainage area of these projects is about 800 square miles. Effects of this single project on the subregion would be small.

Cumulative effects of all projects within the South Atlantic-Gulf Region are not available. Developing effects for such a vast area is beyond the scope of this plan. Consequently cumulative impacts were considered for the Satilla River Basin. This river basin, in which the watershed is located, represents 9.5 percent of Subregion 6 and 1.3 percent of the South Atlantic-Gulf Region.

Cumulative effects on flood stages in this river basin were developed considering three operational projects, this proposed project, and potential projects. This evaluation on the Satilla immediately downstream from the confluence with the Alabaha showed an increase of 0.1 foot for the 3-year flood and an increase of less than 0.1 foot for the 50-year flood. Evaluation of the Satilla near Dover Bluff showed no measurable change in flood stage.

The cumulative effects of water management after installation of this plan, in conjunction with other projects in the Satilla Basin, will not be detrimental to the trees and other vegetation in the flood plain downstream.

The existing and proposed channel work of the projects within the Satilla Basin is located to drain cropland, pastureland, and wooded areas that consist of pine stands. Drainage provided in the pine woodlands will influence the understory vegetation within the project areas. Such vegetation as myrtle, gallberry, and palmetto may be reduced and replaced by broomsedge, panicum, and switchgrass.

This change will occur only in the areas in which drainage and timber management are carried out. Since this consists of less than 1 percent of the total basin area, cumulative impacts on wetland or upland flora can be considered insignificant.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Open channels, referred to locally as canals, will replace 7 acres of open agricultural land and 44 acres of woodland. These areas will be precluded from former uses, however due to the existing soil conditions, current production is low to negligible.

CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

General

The Mill Branch Watershed Association was organized and officials elected in September 1954. This action occurred during a public meeting in the Bacon County Courthouse. An application for assistance under provisions of PL-566, the Watershed Protection and Flood Prevention Act, was approved on October 4, 1954. A field examination and report to the State Soil and Water Conservation Committee was completed in November 1954. Preliminary surveys and investigations revealed the possibility of a feasible project and planning authorization was approved by the Administrator of the Soil Conservation Service in January 1957. Public meetings, news articles, and individual contacts by planning personnel kept the public informed of progress during the planning process. The tentative plan developed involved a considerable local share of construction cost for irrigation structures. The project sponsors and landowners decided they would be unable to bear this local cost and planning was terminated at their request on December 5, 1960.

In 1969 the sponsors requested that planning of the watershed be resumed. Prior to the resumption of planning, a field reconnaissance was accomplished by biologists representing the United States Fish and Wildlife Service, Game and Fish Division, of Georgia Department of Natural Resources, and Soil Conservation Service. Upon completion of the study, these biologists presented their findings at a public meeting in the Bacon County Courthouse on February 17, 1970. The Administrator of the Soil Conservation Service reauthorized planning on December 31, 1970. The State Conservationist notified all appropriate state and federal agencies in advance that planning assistance to the legal sponsors of the project would be resumed. Many of the agencies responded. All responses were positive and pledged assistance as needed. The Executive Director of the Alma-Bacon County Model Cities Commission indicated by letter that "the Model Cities Commission is firmly in support of this project and recommends that it be undertaken as soon as possible. In the past, flooding and ponding due to poor drainage conditions have severely affected our agricultural development. The major objective of our Model Cities program is to strengthen our overall economy. This objective cannot be satisfactorily achieved without a county wide program of watershed management and increased agricultural production. The Commission and its staff will assist the Soil Conservation Service in any way necessary in planning and implementing this or any other watershed project in the county."

During the second planning effort three public meetings and numerous conferences with watershed association officials were held. Planning inputs were supplied by other agencies and landowners in the watershed. The work plan proposal was presented to local agency representatives prior to presentation to the general public. Representatives of the following agencies and organizations participated: Agricultural Stabilization and Conservation Service, Farmers Home Administration, Soil Conservation Service, Georgia Forestry Commission, Game and Fish Division of Georgia Department of Natural Resources, Model Cities Program, Rural Development Center, Tifton, Georgia, and Abraham Baldwin Agricultural College. All public meetings were publicized in the local news media. Those in attendance voiced no opposition to the project.

Preliminary draft work plans and environmental impact statements labeled "Preliminary Draft - Subject to Revision" were mailed to federal and state agencies in April 1972. Comments received were helpful in preparing subsequent drafts. In his comments on these drafts, the Director of the Game and Fish Division of Georgia Department of Natural Resources pointed out that his Division "had no opposition to the project."

A public information meeting and informal field review was held on February 18, 1975. All concerned federal and state agencies and interested citizens were furnished with advance copies of the Draft Plan and EIS and were invited to attend and participate in this meeting. No objection to the project was raised at the meetings.

On February 21, 1975 the draft plan and environmental impact statement were mailed to federal and state agencies and concerned citizens for their review and comment. Comments were received from concerned agencies by the end of May 1975.

With another PL 566 project in the review process at the same time, state agencies and the Soil Conservation Service mutually agreed that the review of Mill Branch be delayed. This request was granted with the agreement that the review would be re-initiated at some date agreeable with the state agencies and SCS.

Representatives of the Soil Conservation Service and concerned state agencies met on October 14, 1975 and February 12, 1976 to informally review the project.

Those environmental concerns that were identified at these meetings were addressed by the SCS as a part of the formal review process that was reinstated by state agencies on February 24, 1976. These concerns were formalized as review comments that were received at the end of the 30-day review period on March 24, 1976. Contacts were made on two other occasions to discuss responses to these formal comments.

During project formulation, consideration was given to the Plan for Development of the Land and Water Resources of the Satilla-St. Marys Basins. This plan was prepared by the United States Study Commission and published in 1963. Objectives included in the Basin Plan that are proposed for this watershed include flood prevention, agricultural and forest water management, soil conservation, and forest conservation and utilization.

The following agencies and organizations were asked to comment on the Draft Environmental Statement:

- | | |
|---|-----------------------------------|
| 1. Department of the Army | 13. University of Georgia |
| 2. Department of Commerce | Institute of Ecology |
| 3. Department of Health, Education,
and Welfare | 14. University of Georgia |
| 4. Department of the Interior | Institute of Natural Resources |
| 5. Department of Transportation | 15. University of Georgia |
| 6. Environmental Protection Agency | Cooperative Extension Service |
| 7. USDA, Office of Equal Opportunity | 16. League of Women Voters |
| 8. Advisory Council on Historic
Preservation | 17. Audubon Society |
| 9. Federal Power Commission | 18. Garden Clubs of Georgia |
| 10. Governor of Georgia | 19. Sierra Club |
| 11. State Clearing House | 20. Georgia Wildlife Federation |
| 12. Regional Clearing House | 21. Wildlife Management Institute |
| (Southeast Georgia Area Planning
and Development Commission) | 22. Isaac Walton League |
| | 23. Georgia Conservancy |

Comments were received from the following agencies: (1) Georgia State Clearing House (comments from Department of Natural Resources and Southeast Georgia Planning and Development Commission), (2) Department of Transportation, State of Georgia, (3) Department of the Interior, Office of the Secretary, (4) Environmental Protection Agency, Region IV, (5) Department of Health, Education, and Welfare, Region IV, (6) Department of the Army, Savannah District Corps of Engineers, (7) Department of Transportation, Federal Highway Administration, and U. S. Coast Guard.

Discussions and Disposition of Each Comment on Draft Environmental Impact Statement.

Each issue, problem, or objection is briefly summarized and a response given on the following pages. Comments are numbered where agencies have supplied multiple comments. Copies of the comments in their entirety are attached as Appendix F.

I. State of Georgia

A. State Clearinghouse - Office of Planning and Budget

1. Comment:

"As a result of the environmental review process, the activity this document was prepared for is recommended for further development"

Response:

None.

2. Comment:

"In the revision and finalization of the project and, specifically the Environmental Impact Statement (EIS), the State of Georgia requests that the Soil Conservation Service and if appropriate, the sponsors of this project and the State Soil and Water Conservation Committee, work closely and conscientiously with those agencies of State government having concerns and responsibilities relating to this project and its potential impacts upon the economic, social, and environmental well being of Georgia's citizens."

Response:

Personnel of the Soil Conservation Service have communicated with the personnel of the Department of Natural Resources and Office of Planning and Budget. Those involved are in agreement that the concerns have been conscientiously addressed.

3. Comment:

"Please ensure that the views of agencies which commented on this project is adequately addressed in the formulation of the final project documents."

Response:

This section, "Discussion and Disposition of Each Comment on Draft Environmental Impact Statement," addresses the views of agencies which submitted comments during inter-agency review. The response to these comments indicate the action taken on each respective agencies' views.

4. Comment:

"The State encourages direct contact between the Soil Conservation Service and agencies of State government in the resolution of any issues or concerns prior to formal review of the project documents."

Response:

The General portion of the CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS section has been updated to reflect the contacts made between the Soil Conservation Service and State agencies since the draft documents were circulated for interagency review. We appreciate your concern and plan to increase coordination with State agencies.

5. Comment:

"The State appreciates the efforts exhibited by the Soil Conservation Service to ensure that projects planned through Georgia's Soil and Water Conservation Programs are developed and coordinated with input from State agencies to minimize possible conflicts with State goals, objectives and policies. These efforts should be continued and increased as opportunities arise."

Response:

The Soil Conservation Service plans to continue and increase its coordination efforts as opportunities arise.

B. State Clearinghouse - Department of Natural Resources

1. Comment:

"Detritus and Mineral cycling; thesis - by reducing the sedimentation into the river there will be a reduced detritus and mineral availability in the riverine ecosystem and potentially the marsh system as well. What, if any, is the amount of this reduction? What, if any, are the ecosystem results?"

Response:

Additional data has been added to the plan and EIS on page 36 and 30 respectively, to further quantify the project effects on gross erosion and sediment yield.

The effect on the river ecosystem and the Satilla River estuary by a reduction in sediment yield of the magnitude described would be immeasurable.

This project is not expected to have an effect on organic detritus. These materials are derived primarily from the wide wooded flood plains of the river basin. The flooding processes provide the mechanism whereby these materials become a part of the suspended load. Flooding in these areas will continue after this project is installed.

The inorganic nutrients that enter the ecosystem through the solution of soil minerals will also be little affected by the project. These nutrients, most of which are transported in solution with runoff and streamflow, will continue to be produced by those weathering processes that cause their release.

2. Comment:

"Islands sand budget; thesis by affecting sedimentation and/or river flow there will be some effect on the natural barrier island building process. If there is an effect it will affect major projects attempting to maintain or rebuild these island artificially. This will be partially addressed in discussions on change of river flow regime."

Response:

The Geological Survey estimates that approximately 10 percent of the sediment yield from the Satilla River drainage basin is in the form of bedload.^{10/} Of this 10 percent, only 35 percent would be of a size equivalent to the medium grain size for Georgia beach sand. The reduction of beach size sand from the 100-ton reduction in sediment yield from the project, would equal about 4 tons annually. For all projects installed in the Satilla River Basin, the reduction in beach sized material would be approximately 35 tons annually.

^{10/} Vance C. Kennedy, "Sediment Transported by Georgia Streams," Geological Survey Water-Supply Paper 1668, 1964, pp. 76-77.

Research on Georgia beaches, with comparable studies of river and beach mineralogy and particle size analysis of beach materials, also indicates that coastal plain rivers are not important contributors to present-day beach sediments.^{11/} Therefore, the magnitude of reductions in sediment yield from the Satilla River, with its drainage area entirely in the lower coastal plain, would have no measurable effect on coastal beaches and sand budgets for barrier islands such as the Cumberland.

Possible project effects on river flow regime were considered and an evaluation of these effects were included in the response to the next comment.

3. Comment:

"Cumulative effects; thesis - many projects in and of themselves are often innocuous, however, in conjunction with other projects (related by geography and/or type), produce unacceptable cumulative effects. The following examples should be addressed and may be expanded:

- (a) Flood Stages
- (b) Effect on wetland or upland flora (i.e., cypress stands).
- (c) Ecosystem changes (will address this point somewhat in our meeting as adaptability range).
- (d) River meander - acceleration - deceleration.
- (e) Shellfish in river and estuaries (related to first two comments).
- (f) Estuarine salinity (relates to first two comments)."

Response:

The draft environmental impact statement contained a discussion of cumulative impacts. This discussion was supplemented by additional data and can be found on page 39 of the final statement.

The following are the responses to the specific items identified in the comment.

- (a), (b) Additional data were included in the section entitled SHORT-TERM VS. LONG-TERM USE OF RESOURCES.

^{11/} O. H. Pilkey, "Atlantic Beach and Dune Sediments of the Southern United States, "Journal of Sedimentary Petrology, 1965, V. 35, pp. 900-910.

- (c) Ecosystems within the project area will be modified. The understory vegetation in the pine woodlands will change. The trend of converting low producing cropland and pastureland to pine woodlands which is reducing open space needed by wildlife will stop. Drainage benefits to cropland and pastureland will preserve these as openlands for use by certain species of wildlife. Existing open space areas are essential in the Satilla River Basin and in general Southeast Georgia to maintain the ecosystem balance.
- (d) Changes in the meandering processes of the Satilla River or other streams within the basin will not occur as a result of PL-566 projects. River stage or sediment load changes are not of a magnitude which would alter this continuous natural process.
- (e) No changes were made in the environmental impact statement in relation to this comment. Responses to comments (1) and (2) indicate that effects to detritus, mineral cycling, and barrier island sand budgets will be immeasurable. Consequently, shellfish in rivers and estuaries will not be measurably affected.
- (f) When analyzing the effects of the increased flow from the Mill Branch Watershed and the cumulative effects from other existing and proposed projects on the Satilla River Basin, present day methods are inadequate to quantify change in salinity of a magnitude as small as that which would be brought about by the projects.

Natural processes, which cause phenomena such as vertical mixing, stratification, and wedges to occur, bring about great changes in estuarine salinity and the zone of influence. Organisms which occupy these areas are well adapted to frequent and radical changes.

C. Regional Clearing House - Southeast Georgia Area Planning and Development Commission

1. Comment:

"The Southeast Georgia APDC has reviewed the draft environmental impact statement and concurs with its findings and recommendations."

Response:

None.

D. Department of Transportation

1. Summary of Comment:

It appears that the project will bring about substantial and beneficial changes in the existing drainage in the project area. It is difficult, however, to determine impacts to the transportation network since maps or detailed descriptions are not included. Planned changes on state or federal road systems should be coordinated with 5th District Office in Jesup.

Response:

The 5th District Office has been contacted by personnel of the Soil Conservation Service and proposed changes have been discussed with DOT officials in that office. Maps were furnished to show the proposed locations for culvert changes.

2. Summary of Comment:

Statements are made concerning advantages to the highway system through construction of the project. It would be helpful if you included a list of transportation facilities (apparently an airport is one) which would benefit, and an indication of the drainage related maintenance and service problems which have historically beset them.

Response:

The copy of the EIS reviewed by the Department of Transportation did not have a Project Map. The final contains such a map in Appendix B. The location of the facilities are exhibited where project channels and unimproved county roads intersect.

Damages occurring to transportation facilities in the watershed are due primarily to inundation by floodwater and poor drainage outlets for existing culverts. These problems most commonly occur on the county's extensive dirt road network. Damages to these roads consist of dislodged culverts, eroded road fills, and softened road beds. Traffic has to be re-routed for several days until floodwater recedes and roads can be repaired. Repairing these damages usually demands heavy equipment to grade and reshape road beds and haul in additional fill material.

Monetary benefits were not evaluated for the Alma airport, however, incidental benefits, such as improved conditions

for mowing and other maintenance operations, will result from the improved drainage provided.

3. Comment:

"... it would be helpful from our standpoint, if you would, in future documents of this type, have a separate section in the report which deals specifically with impacts to transportation facilities and related coordination efforts."

Response:

This document was prepared in accordance with part 650 of the Soil Conservation Service guidelines for the preparation of Environmental Impact Statements (39 FR 19651) June 3, 1974. We address all effects and probable impacts under the general heading of ENVIRONMENTAL IMPACTS. Material in this section is organized under the following headings: Conservation Land Treatment, Nonstructural Measures, Structural Measures, and Economic and Social. Impacts to transportation facilities will appear under these headings unless the guidelines are changed or amended.

II. United States

A. Department of the Interior - Office of the Secretary

1. Comment:

"Mill Branch and tributaries support a low value fishery composed primarily of largemouth bass, bluegill, warmouth bass, catfishes, and suckers. Stream fishing is confined to the lower main stem where no works are proposed. Wildlife resources of low value consist primarily of rabbit, squirrel, quail, dove, fox, and raccoon. Migrant waterfowl usage of the watershed is low. Detrimental effects to fish and wildlife resources are expected to be minimal with the project as designed."

Response:

None.

2. Summary of comment:

Every effort should be made to protect the farm ponds on Mill Branch from construction induced sedimentation.

Response:

Appropriate measures have been incorporated in the EIS PLANNED PROJECT section to insure that the impacts on these ponds, as a result of increased erosion during channel installation, will be minimized.

3. Comment:

"Potential adverse environmental impacts related to geologic conditions have been given adequate consideration in the draft environmental statement and work plan, insofar as proposed channel work and land treatment is concerned."

Response:

None.

4. Comment:

"The proposed paving of 75 miles of country roads is mentioned only in the addendum to the watershed work plan dated August 1974. The location of the proposed paving has not been identified, and it is not clear whether the draft environmental statement is intended to cover that action."

Response:

The environmental statement is not intended to cover this action. The environmental quality plan as presented in the work plan addendum was prepared to be consistent with the requirements of the Water Resource Council's Procedure No. 1 for the phase-in of the Principles and Standards. This element of the environmental quality plan was not included as part of the selected plan and cannot be implemented under the authorities through which the work plan and environmental statement were developed.

5. Comment:

"Several foreseeable impacts of the action on water resources are identified in the statement (page 34); however, the descriptions of these impacts are incomplete and it is difficult to evaluate them against the water resource descriptions in the 'Environmental Setting' section of the statement."

Response:

Information on page 34 is intended to be a listing only. The ENVIRONMENTAL SETTING is supplemented with other information under the PLANNED PROJECT section, page 5. This section provides descriptions of actions and details that relate to water resources. More specifically items that relate to impacts on water resources are:

Page 5 - Land treatment on croplands.

Page 6 - Land treatment on grasslands, critical areas, miscellaneous lands and forest lands.

Page 8 - Structural measures vegetation and structural weirs.

Page 9 - Sediment storage basins and construction procedures.

6. Summary of Comment:

It appears that the project will have no adverse effect on sand, the only known mineral resource in the area. The statement adequately described project impacts on fish and wildlife resources.

Response:

None.

7. Summary of comment:

The statement should identify and discuss the relationship of the project to those existing and proposed recreation areas in the project vicinity. Impacts on cultural resources and references to coordination with Area Planning and Development Commission should be discussed. The statement needs to describe the possible activation of P.L. 93-291.

Response:

The Recreation Resources section of the ENVIRONMENTAL SETTING section of the statement has been expanded to cover existing recreational areas. The project is not expected to have an impact on any of these resources. The Area Planning and Development Commission was consulted as a project reviewer and their comments are included in this document. The statement has been changed to reflect the results of an archeological study and there are no impacts expected on cultural resources. This study was

performed by The University of Georgia, Department of Anthropology. Statement has been amended to include compliance with P.L. 93-291.

8. Comment:

"A map portraying existing and proposed land uses should be incorporated in the final statement."

Response:

The development of a land use change map is impractical. It is anticipated that 500 acres of forest land will be converted to cropland. The exact location of these 500 acres will be determined by the landowners involved. See page 39 for anticipated trends in land use change. These trends are not dependent upon project action, and the exact location of where these changes will occur are not known.

B. Environmental Protection Agency - Region IV

1. Comment:

"First, it appears that some of the project area might be classified as wetland that has implications pursuant to Section 404 of the Federal Water Pollution Control Act Amendments of 1972. If this is the case, the final impact statement should address the need for a U. S. Army Corps of Engineers permit for the discharge of dredge and fill material. It is indicated that extensive diking and stream bank protection measures will require discharges of dredge and fill material into waters of the United States. Unless a Section 404 permit is obtained, such discharges will violate Section 302 (a) of the Act."

Response:

The PLANNED PROJECT section of the statement has been amended to include compliance with applicable laws, permits, regulations or agreements.

2. Comment:

"In addition, it should be made clear that the receiving streams are capable of handling the upstream channelized flows, including floods. Otherwise, the final impact statement should describe measures that will be taken to prevent flooding and sediment disposition at the junction of the two hydraulic units."

Response:

Page 9 of the EIS has been amended to further describe sediment abatement procedures to be used during project installation. Page 32 describes a hydrologic analysis of the downstream effects. The table shows increased water surface elevations as a result of the project. The receiving streams will accommodate the increased runoff with changes in stages shown.

3. Comment:

"Mention is made (Page 2) of three existing farm ponds on the mainstem of Mill Branch downstream from significant channelization. If these three impoundments have adequate dams, spillways, and outlets for the flood-stage increases to be induced by the project, it should be stated."

Response:

See page 8 of the statement for explanation.

4. Comment:

"Also, precautions should be taken during the extensive channelization to prevent possible groundwater contamination and the deformation of an existing water supply recharge area. In addition, we suggest continuous monitoring of all stated sediment traps and basins to avoid any unnecessary water pollution."

Response:

Mill Branch project is not in an area considered to be part of the recharge area for the Principal Artesian Aquifer and will not affect groundwater supplies. See page 13 of EIS. Sediment from channel construction is the type of pollution expected to be contained within installed sediment traps. These traps will be monitored to insure proper operation.

5. Comment:

"Finally, (on Pages 35 and 36), the cost of alternatives 1, 2, and 3 are stated as total costs, whereas alternative 4 is stated as a net annual figure, and (on Page 41), the cost of the proposed project is stated as an annual figure. We suggest that, for easier comparison, the equivalent annual cost of alternatives 1, 2, and 3 should also be given."

Response:

Alternative No. 4 (No Project Alternative) has no installation cost. The net annual figure given in Alternative No. 4 reflects the difference in annual benefits and annual costs that are displayed in Appendix "A". This figure was included to show the total benefits foregone by not implementing the selected plan. Total installation cost of the selected alternative is given on page 12. Annual cost figures displayed in Appendix "A" are for purposes of comparison to reflect benefit-cost ratios of different evaluation units.

C. Department of Health, Education, and Welfare

1. Comment:

"Based upon the data contained in the draft, it is our opinion that this proposed action will have only a minor impact upon the human environment with respect to the concerns of this Department."

Response:

None

D. Department of the Army

1. Comment:

"The improvements proposed should benefit the local area and are not expected to adversely affect any existing projects of the Corps of Engineers nor conflict with any future development of downstream projects."

Response:

None

E. Department of Transportation - Federal Highway Administration

1. Summary of Comment:

The statement does not contain a map illustrating the area to be covered by the project. Suggest that a map be included to outline the area affected, showing the highways and other modes of transportation crossing the area and the location of proposed drainage channels.

Response:

Evidently the Project Map was inadvertently left out of your copy of the EIS. A map has been included in the Final EIS showing locations of highways and proposed channels as well as other pertinent data.

2. Summary of Comment:

By installing channels where none existed previously, runoff will occur more rapidly. With this increased flow, the concern here is that existing bridge structures could be undermined. Stability of embankments could also be a problem and consideration should be given for riprap or other protective means.

Response:

The design criteria of the project channels includes provisions that installed channels will be stable.

F. Department of Transportation - United States Coast Guard

1. Comment:

"The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project."

Response:

None

LIST OF APPENDIXES

Appendix A - Comparison of Benefits and Costs

Appendix B - Project Map

Appendix C - Figure 1

Appendix D - Figure 2

Appendix E - Figure 3

Appendix F - Letters of Comment Received on the Draft E.I.S.

Appendix G - Bibliography

APPROVED BY

Dwight M. Treadway
Dwight M. Treadway
State Conservationist

DATE

May 19, 1976

COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Mill Branch Watershed, Georgia

(Dollars)

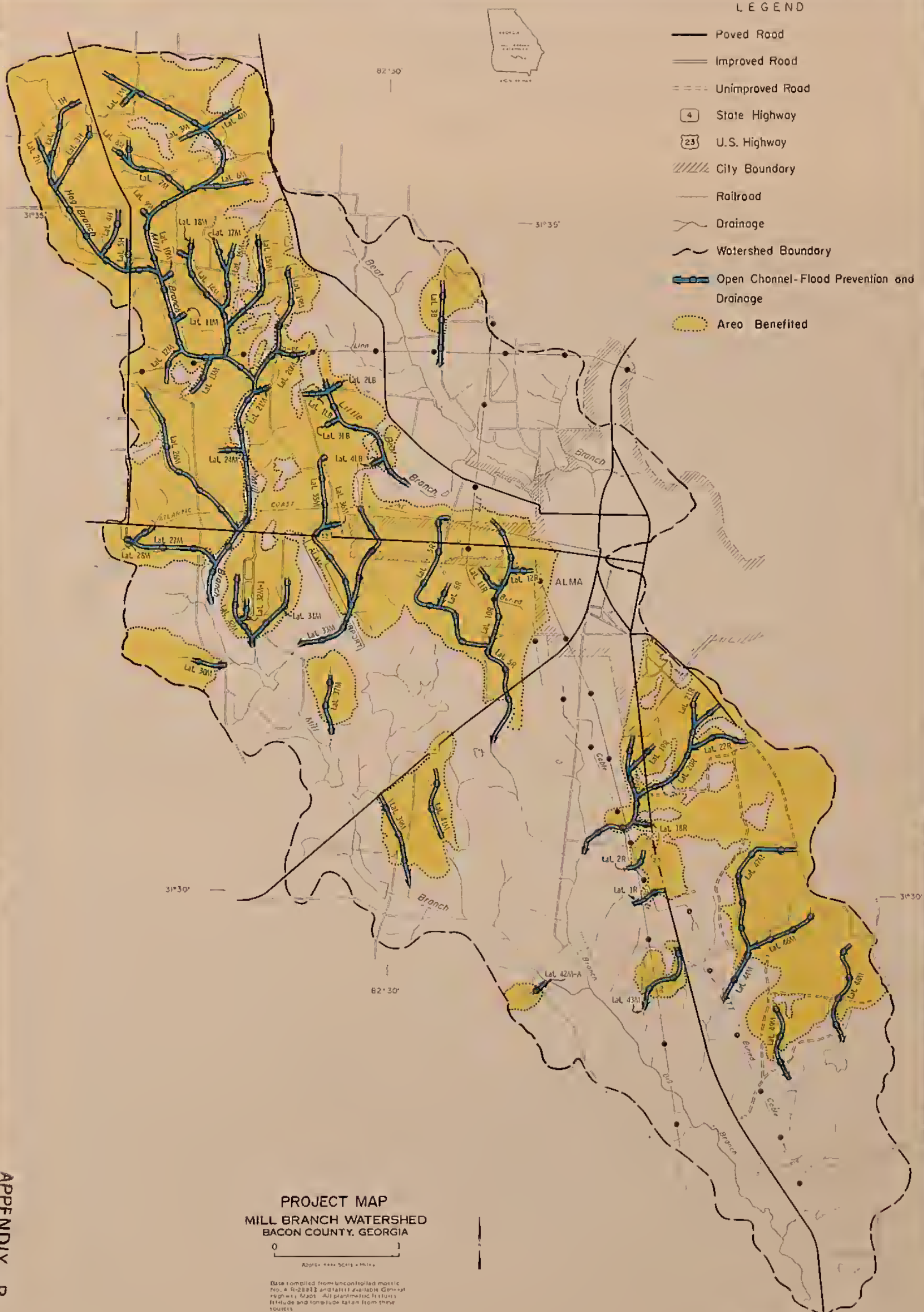
Evaluation Unit	AVERAGE ANNUAL BENEFITS 1/				TOTAL	Average Annual Cost 3/	Benefit Cost Ratio
	Flood Prevention Damage Reduction	Drainage		Secondary			
		Improved Efficiency 2/	Redevelopment				
3 B Little Bear, 1 LB, 2 LB, 3 LB, 4 LB Mill Branch 17+00 to 151+00 1 M, 3 M, 4 M, 6 M, 7 M, 8 M, 9 M Hog Branch, 1 H, 2 H, 3 H, 4 H, 5 H Mill Branch 151+00 to 208+00 10 M, 11 M, 12 M, 13 M, 14 M, 15 M, 16 M, 17 M, 18 M Mill Branch 208+00 to 347+00 19 M, 20 M, 21 M, 24 M, 26 M, 27 M, 28 M 30 M 31 M, 32 M, 32 M-1 33 M, 35 M, 36 M 37 M 39 M 41 M 42 MA 43 M 44 M, 46 M, 47 M 48 M 49 M 1 R 2 R 5 R, 8 R, 10 R, 11 R, 12 R 18 R, 19 R, 20 R, 21 R, 22 R, Rigdon	1,056 3,770 13,110 8,358 14,148 12,108 1,028 4,265 8,077 1,099 1,395 1,686 332 894 5,92 2,097 1,206 202 1,071 10,799 4,640	959 2,946 6,517 4,498 5,663 9,806 535 1,777 5,843 999 669 1,533 303 413 4,785 1,906 1,096 184 374 5,918 4,217	186 388 1,270 763 1,675 2,286 84 456 950 84 230 103 71 131 548 218 130 80 55 1,451 1,286	723 2,444 5,000 3,070 3,358 6,794 387 1,165 4,552 871 375 1,361 197 230 3,943 1,604 865 81 285 3,738 2,706	2,924 9,548 25,897 16,689 24,826 30,994 2,034 7,663 19,422 3,053 2,669 4,683 903 1,668 15,201 5,825 3,297 547 1,785 21,906 12,849	1,061 2,206 7,351 4,388 9,586 12,765 468 2,590 5,384 468 1,295 581 407 732 3,076 1,229 723 445 305 8,327 7,439	2.8:1.0 4.3:1.0 3.5:1.0 3.8:1.0 2.6:1.0 2.4:1.0 4.3:1.0 3.0:1.0 3.6:1.0 6.5:1.0 2.1:1.0 8.1:1.0 2.2:1.0 2.3:1.0 4.9:1.0 4.7:1.0 4.6:1.0 1.2:1.0 5.9:1.0 2.6:1.0 1.7:1.0
Project Administration	---	---	---	---	---	6,460	---
GRAND TOTAL	97,266 4/	60,941	12,427	43,749	214,383	77,286	2.8:1.0

1/ Price Base: Agricultural Products - Current Normalized; Others 1976
2/ Represents reduced production cost, improved quality plus increases in production.
3/ Price Base: 1976 Costs amortized at 6 1/8% interest rate for 100 years.
4/ In addition it is estimated land treatment measures will provide flood prevention benefits of \$900 annually.

Date: April 1976

LEGEND

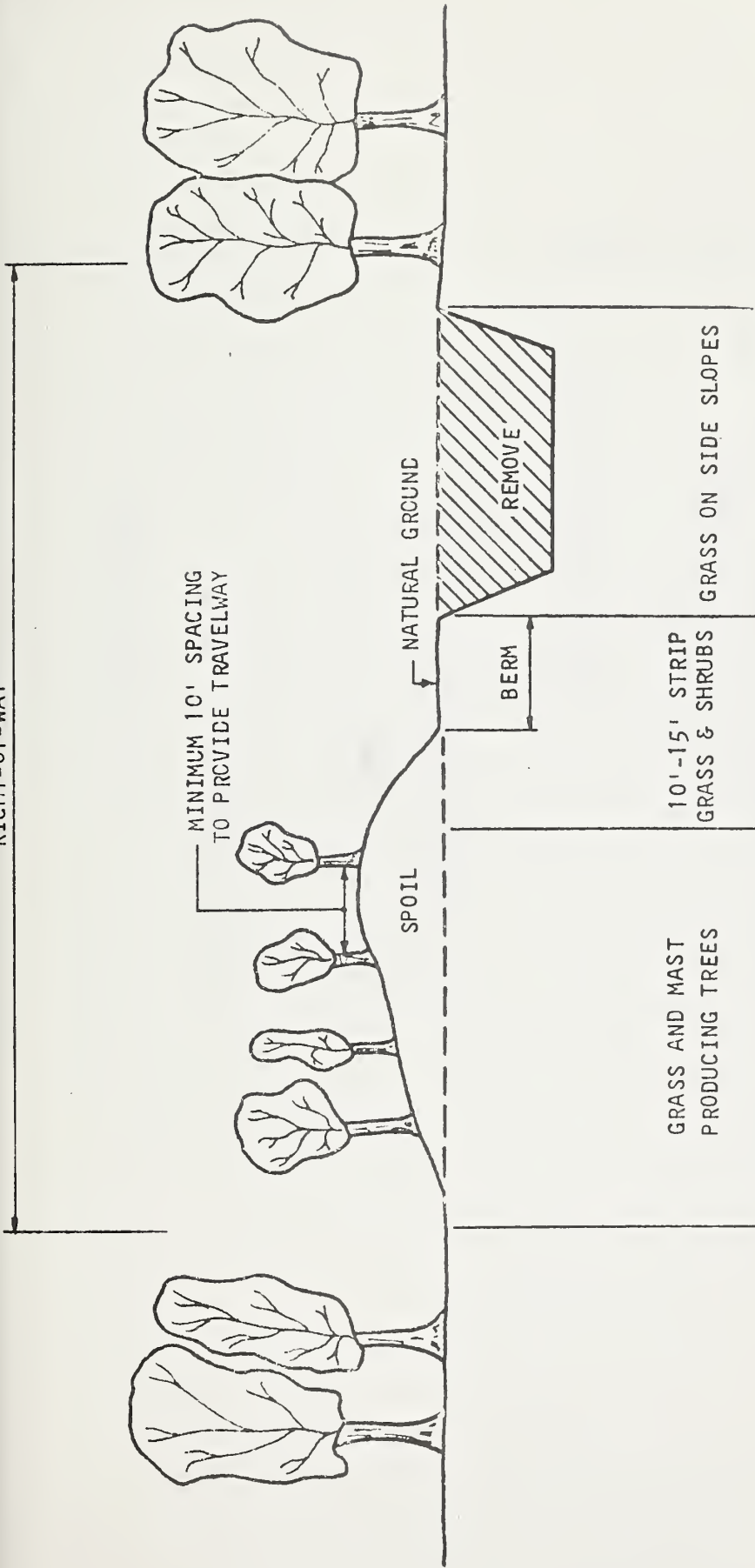
- Paved Road
- Improved Road
- Unimproved Road
- State Highway
- U.S. Highway
- City Boundary
- Railroad
- Drainage
- Watershed Boundary
- Open Channel-Flood Prevention and Drainage
- Area Benefited



PROJECT MAP
MILL BRANCH WATERSHED
BACON COUNTY, GEORGIA

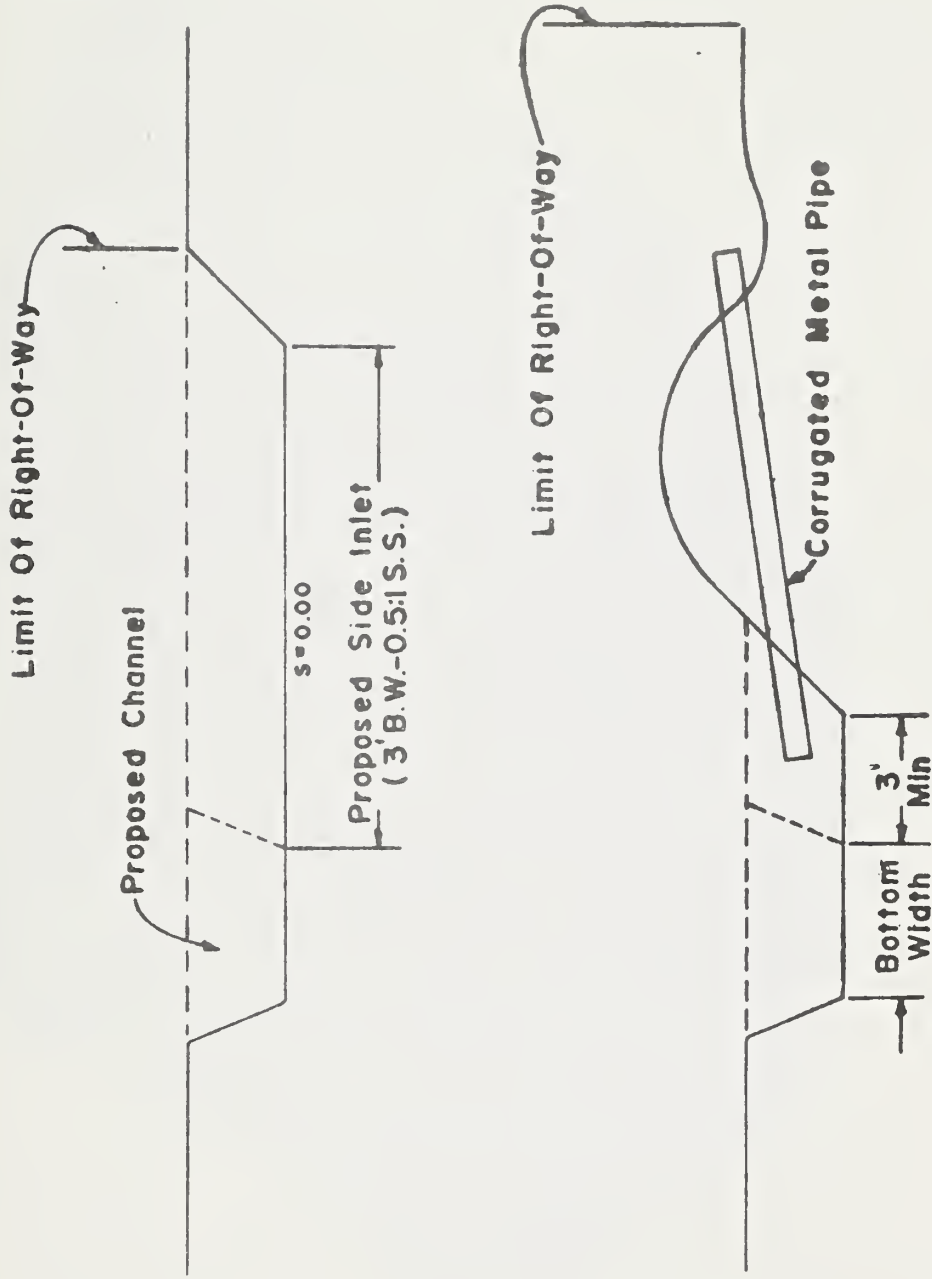
0 1
Approx. 1/4 inch = 1 mile

Base compiled from uncontrolled metric
No. A R-28812 and latest available General
Highway Maps. All planimetric features
include and longitude taken from these
sources.

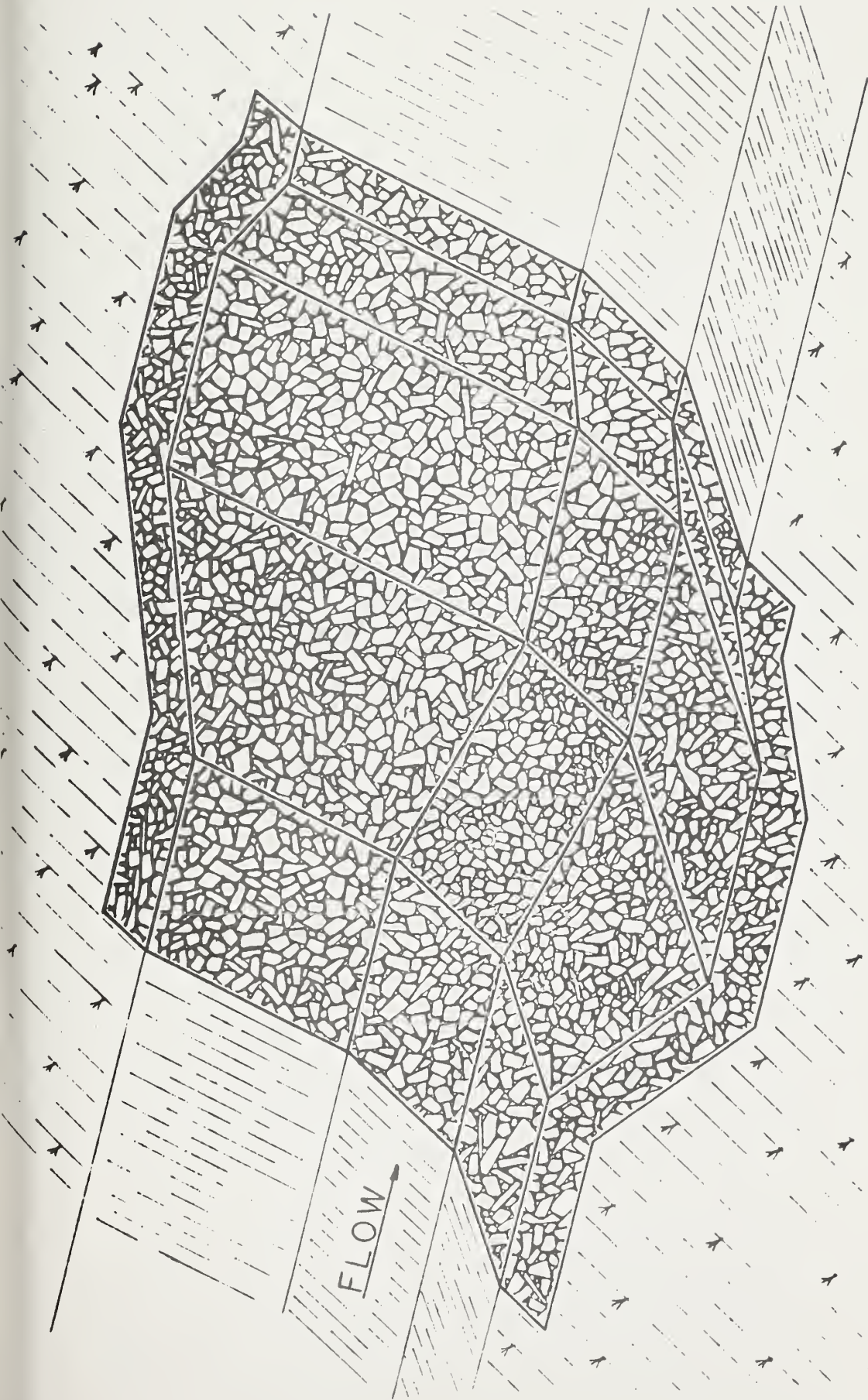


TYPICAL CHANNEL SECTION

FIGURE 1



TYPICAL PROFILES OF SIDE INLETS



TYPICAL ROCK STABILIZATION STRUCTURE
FIGURE 3
APPENDIX - E

APPENDIX F

Letters of Comments Received on the Draft Environmental Statement



Office of Planning and Budget

Executive Department

James F. McIntyre, Jr.
Director

GEORGIA STATE CLEARINGHOUSE MEMORANDUM

TO: Mr. Dwight M. Treadway
United States Department of Agriculture
Soil Conservation Service
P.O. Box 832
Athens, Georgia 30601

FROM: *[Signature]*
Charles H. Wadger, Administrator
Georgia State Clearinghouse
Office of Planning and Budget

DATE: March 30, 1976

SUBJECT: RESULTS OF STATE LEVEL REVIEW

Applicant: U.S. Department of Agriculture/Soil Conservation Service

Project: Mill Branch Watershed--Proposed Changes to EIS

State Clearinghouse Control Number: 76-02-24-14

The State-level review of the above-referenced document has been completed. As a result of the environmental review process, the activity this document was prepared for is recommended for further development with the following recommendations for strengthening the project:

In the revision and finalization of the project and, specifically the Environmental Impact Statement (EIS), the State of Georgia requests that the Soil Conservation Service and if appropriate, the sponsors of this project and the State Soil and Water Conservation Committee, work closely and conscientiously with those agencies of State government having concerns and responsibilities relating to this project and its potential impacts upon the economic, social and environmental well being of Georgia's citizens.

Attached, and to be included in the State's comments and recommendations are the views of those agencies which commented on this project. Please ensure that each of these views is adequately addressed in the formulation of the final project documents. The State encourages direct staff contact between the Soil Conservation Service and agencies of State government in the resolution of any issues or concerns prior to formal review of the project documents.

The State appreciates the efforts exhibited by the Soil Conservation Service to ensure that projects planned through Georgia's Soil and Water Conservation Programs are developed and coordinated with input from State agencies to minimize possible conflicts with State goals, objectives and policies. These efforts should be continued and increased as opportunities arise.

270 Washington St., S. W. • Atlanta, Georgia 30334

SC-4a
Dec.

DWIGHT M. MEADOWAY
76-02-24-14
Page Two

The following State agencies have been offered the opportunity to review and comment on this project:

Department of Natural Resources
Office of Planning and Budget, Executive Department

The applicant may expect comments for this project from the Southeast Georgia APDC.

cc: Bruce Osborn, OPB
Ray Siewert, DNR
Frank Stancil, SS&WCC

Enclosure: Review comments prepared by the Department of Natural Resources, dated March 18, 1976.



Department of Natural Resources

OFFICE OF PLANNING AND RESEARCH

270 WASHINGTON ST., S.W.

ATLANTA, GEORGIA 30334

(404) 636-5180

Joe N. Wanner
COMMISSIONER

Charles M. Harriah, III
DIVISION DIRECTOR

March 18, 1976

MEMORANDUM

TO: Chuck Badger, Administrator
State Clearinghouse

FROM: Ray Siwert, Coordinator
Comprehensive Review

ISSUE: Completion of Department of Natural Resources Review of
State Clearinghouse Control Number 76-02-24-14

APPLICANT: U.S. Department of Agriculture/Soil Conservation Service

PROJECT: Mill Branch Watershed - Proposed Changes to EIS
(See 75-02-25-09)

APPROVAL

This proposal is considered to be consistent with those State goals, policies, objectives, plans, programs, and fiscal resources with which this organization is concerned.

CONTINGENCIES

We refer you to our letter to the S.C.S. of February 26, 1976 (attached).

RHS:esd

cc: Jim Setser
Claude Hastings
Bill Clark
Louise Barrett
Don Klima
Lewis Larson
Larry Hodges
Bruce MacGregor





Department of Natural Resources

270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334
(404) 656-3500

Joe B. Tanner

COMMISSIONER

February 26, 1976

Les M. Parrish, III

EXECUTIVE ASSISTANT

Mr. Willdon Fontenot
Watershed Planning Leader
Soil Conservation Service
Post Office Box 8310
Athens, Georgia 30601

Dear Will:

Per our meeting on February 12, and our subsequent telephone conversation, I am further defining the three points brought out by DNR's staff.

The first two are somewhat interrelated:

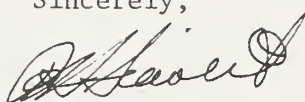
1. Detritus and Mineral cycling; thesis - by reducing the sedimentation into the river there will be a reduced detritus and mineral availability in the riverine ecosystem and potentially the marsh system as well. What if any is the amount of this reduction? What if any are the ecosystem results. (Should be done by Biologist with assistance from a Geologist/Hydrologist).
2. Islands sand budget; thesis by affecting sedimentation and/or river flow there will be some effect on the natural barrier island building process. If there is an effect it will affect major projects attempting to maintain or rebuild these island artificially. This will be partially addressed in discussions on change of river flow regime. (Should be addressed by Hydrologist/Geomorphologist).
3. Cumulative effects; thesis - many projects in and of themselves are often innocuous, however in conjunction with other projects (related by geography and/or type) Produce unacceptable cumulative effects. The following examples should be addressed and may be expanded:
 - (a) Flood Stages
 - (b) Effect on wetland or upland flora (i.e. cypress stands)
 - (c) Ecosystem changes (will address this point somewhat in our meeting as adaptability range)
 - (d) River meander - Acceleration - deceleration
 - (e) Shellfish in River and Estuaries (relates to 1 and 2)

Mr. Willdon Fontenot
Page Two
February 26, 1976

(f) Estuarine Salinity (relates to 1 and 2)

Will, my principle regret is that these issue were not raised in the October meeting. I do feel that by addressing them the E.I.S. and thus the project will be strengthened. We will include these points in our comments on the E.I.S.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Ray Siewert', with a stylized flourish at the end.

Ray Siewert
DNR Review
Coordinator

C.C. Lewis Larson
Lillian Dean
Jim Setser
Claude Hasting
Bill Clark
Lonice Barrett
Don Klima
Larry Hodges
Bruce MacGregor

RS:dm

Date: March 25, 1976

Mr. Charles W. Barlett
State Conservationist
Soil Conservation Service
U.S. Dept. of Agriculture
P. O. Box 832
Athens, Georgia 30601

FROM: Name: Ed Bodenhamer *E. Bodenhamer*
Title: Executive Director
Regional Clearinghouse: Southeast Georgia APDC

SUBJECT: PROJECT NOTIFICATION AND REVIEW
Applicant: U.S. Dept. of Agriculture/Soil Conservation Service
Project: Mill Branch Watershed-Proposed Changes to EIS
(See 75-02-25-09)
State Clearinghouse Control Number: 76-02-24-14
Regional Clearinghouse Staff Contact: F. Marion Hay

The Regional Clearinghouse has reviewed the Summary Notification for the above project.

As a result of the review it has been determined that the proposed project is in accord with regional and local plans, program and objectives as of this date. You should now complete and file your formal application with the appropriate Federal agency(s). A copy of this form must be attached to your application.

If you have any questions, please contact the clearinghouse staff member named above, who will be pleased to assist you.

Comment: The Southeast Georgia APDC has reviewed the draft environmental impact statement and concurs with its findings and recommendations.

Copy to State Clearinghouse



Department of Transportation

State of Georgia

No. 2 Capitol Square

Atlanta, Georgia 30334

THOMAS D. MORELAND
STATE HIGHWAY ENGINEER
W. M. WILLIAMS
SECRETARY-TREASURER

WINNING MUSGROVE
COMMISSIONER
JOY C. PARRISH
DEPUTY COMMISSIONER

February 19, 1975

Mr. Charles W. Bartlett
State Conservationist
United States Department of Agriculture
Soil Conservation Service
P.O. Box 832
Athens, Georgia 30601

Dear Mr. Bartlett:

This is in response to your January 16, 1975 letter "Notice of Public Information Meeting" and the attached Draft Environmental Impact Statement for the Mill Branch Watershed Project in Bacon County, which was forwarded to us by the Federal Highway Administration.

It appears that the watershed project will bring about substantial and beneficial changes in the existing drainage in the project area. It is difficult, however, to determine the impacts which would result to the transportation network in the area due to the project, since there are no maps or detailed descriptions of exactly where this work will take place.

One item in the report brings a question to mind. Page seven, paragraph two, mentions that "...alterations of bridges, culverts, and underground utilities at approximately 61 locations" will be necessary. Our 5th District Office in Jesup has indicated that they have not been contacted concerning any such proposal. Perhaps this is due to the fact that there are no facilities on the State or Federal road systems to be involved, or perhaps we have not located the person you contacted. If this is not the case, please coordinate this work with our District Office in your usual manner.

On page 33, paragraph four, and page 34, item four, statements are made concerning advantages to the highway system through construction of the project. Doubtlessly, a study has been made to determine the extend of these advantages. It would be helpful

Mr. Bartlett

-2-

February 19, 1975

if you included a list of the transportation facilities (apparently an airport is one) which would benefit, and an indication of the drainage related maintenance and service problems which have historically beset them. At any rate, any decrease in maintenance cost is certainly welcome.

If I might make an editorial note, it would be helpful, from our standpoint, if you would, in future documents of this type, have a separate section in the report which deals specifically with impacts to transportation facilities and related coordination efforts. We do not generally wish to comment on your projects as they effect the remainder of the environment as you are better able to determine those impacts than we.

We appreciate this opportunity to review your statement and look forward to reading it in it's final form.

Yours very truly,

A handwritten signature in cursive script, reading "Robert C. Kirk".

Robert C. Kirk, P.E.

State Transportation Planning Engineer

PRS:ba

Attachment

cc: T. S. McKenzie, Jr., District Engineer, Jesup District



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

PEP ER-75/179

Dear Mr. Bartlett:

Thank you for your letter of February 21, 1975, requesting our views and comments on the work plan and draft environmental statement for Mill Branch Watershed, Bacon County, Georgia. We have comments on both documents.

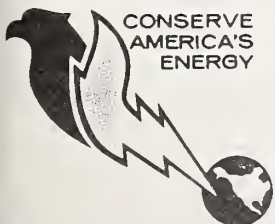
Work Plan

Mill Branch and tributaries support a low value fishery composed primarily of largemouth bass, bluegill, warmmouth bass, catfishes, and suckers. Stream fishing is confined to the lower main stem where no works are proposed. Wildlife resources of low value consist primarily of rabbit, squirrel, quail, dove, fox, and raccoon. Migrant waterfowl usage of the watershed is low. Detrimental effects to fish and wildlife resources are expected to be minimal with the project as designed.

On page 37, paragraph 4, it is stated that some erosion is expected to occur during and immediately after channel construction. It is also stated that this eroded material will be accommodated in sediment traps to be installed along channel reaches or will be trapped in three existing farm ponds located on Mill Branch downstream from about 55 percent of the planned channel work. We believe every effort should be made to protect these farm ponds from construction-induced sedimentation.

Environmental Statement

Potential adverse environmental impacts related to geologic conditions have been given adequate consideration in the draft environmental statement and work plan, insofar as proposed channel work and land treatment is concerned.



Save Energy and You Serve America!

The proposed paving of 75 miles of country roads is mentioned only in the addendum to the watershed work plan dated August 1974. The location of the proposed paving has not been identified, and it is not clear whether the draft environmental statement is intended to cover that action. This should be clarified.

Several foreseeable impacts of the action on water resources are identified in the statement (page 34); however, the descriptions of these impacts are incomplete and it is difficult to evaluate them against the water resource descriptions in the "Environmental Setting" section of the statement.

We have no record of current mineral production from Bacon County. Sand is the only known mineral resource present. From the scope of the project, it appears unlikely that the present proposal would adversely affect significant mineral resources.

In general, we find that the statement adequately describes project impacts on fish and wildlife resources.

Our review does, however, show the statement to be inadequate in its treatment of project impacts on outdoor recreation and cultural resources.

While there is reference on pages 20 and 21 to information contained in Georgia's Statewide Comprehensive Outdoor Recreation Plan, the information obtained from the plan is nowhere related to the project in terms of impact identification. The final statement should identify and discuss the relationship of the project to those existing and proposed recreation areas in the project vicinity.

Impacts on any area should be discussed as should measures to minimize any identified detrimental impacts including alternate project actions. These discussions should reference coordination with recreation planning personnel in the Area Planning and Development Commission. A map portraying existing and proposed land uses should be incorporated in the final statement.

The discussions of cultural resources on pages 21 and 32 are insufficient from several aspects. In accordance with the following discussion, these sections and appropriate sections of the work plan and addendum should be revised.

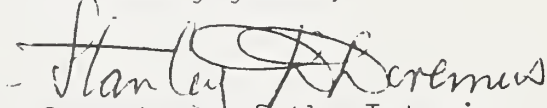
It is noted that no known sites of cultural significance exist within the planned project area. In order to determine the possible existence of presently unknown sites, a survey should be performed within the entire area over which the project may affect cultural resources. (Refer to 36 CFR 800).

The completed archeological survey will form the basis for subsequent decisions under 36 CFR 800. A summary form of this survey together with documented consultations with the State Historic Preservation Officer and the National Register of Historic Places (February 4, 1975) should appear in the final statement. It is insufficient to just furnish project maps to the State Office. If the survey should discover any cultural resources potentially eligible for inclusion in the National Register, the final statement should show the steps being taken to comply with 36 CFR 800.4.

The final statement should also describe the possible activation of P.L. 93-291 (Reservoir Salvage Act Amendments) if it becomes apparent that any of the proposed structural measures could obliterate cultural resources. In such a case, information must be provided to this Department to work out a plan for recovery or protection of the resources.

We hope these comments will assist you in preparing the final project documents.

Sincerely yours,


Secretary of the Interior

Deputy Assistant

Mr. Charles W. Bartlett
State Conservationist
Soil Conservation Service
Department of Agriculture
Post Office Box 832
Athens, Georgia 30601



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309

May 2, 1975

Mr. Charles W. Bartlett
State Conservationist
U. S. Soil Conservation Service
P. O. Box 832
Athens, Georgia 30601

Dear Mr. Bartlett:

We have reviewed the Draft Environmental Impact Statement for the Mill Branch Watershed Project in Bacon County, Georgia, and offer the following comments.

First, it appears that some of the project area might be classified as wetland that has implications pursuant to Section 404 of the Federal Water Pollution Control Act Amendments of 1972. If this is the case, the final impact statement should address the need for a U. S. Army Corps of Engineers permit for the discharge of dredge and fill material. It is indicated that extensive diking and stream bank protection measures will require discharges of dredge and fill material into waters of the United States. Unless a Section 404 permit is obtained, such discharges will violate Section 301 (a) of the Act.

In addition, it should be made clear that the receiving streams are capable of handling the upstream channelized flows, including floods. Otherwise, the final impact statement should describe measures that will be taken to prevent flooding and sediment disposition at the junction of the two hydraulic units.

Mention is made (Page 2) of three existing farm ponds on the main stem of Mill Branch downstream from significant channelization. If these three impoundments have adequate dams, spillways, and outlets for the flood-stage increases to be induced by the project, it should be stated.

Also, precautions should be taken during the extensive channelization to prevent possible groundwater contamination and the deformation of an existing water supply recharge area. In addition, we suggest continuous monitoring of all stated sediment traps and basins to avoid any unnecessary water pollution.

Finally, (on Pages 35 and 36), the cost of alternatives 1, 2, and 3 are stated as total costs, whereas alternative 4 is stated as a net annual figure, and (on Page 41) the cost of the proposed project is stated as an annual figure. We suggest that, for easier comparison, the equivalent annual cost of alternatives 1, 2, and 3 should also be given.

In view of the foregoing, we have assigned a rating of LO- (lack of objection) to the project and 2 (insufficient information) to the Impact Statement.

Please send us five copies of the final environmental impact statement when it is available, and if we can be of further assistance in any way, please let us know.

Sincerely,

A handwritten signature in dark ink, appearing to read "David R. Hopkins". The signature is fluid and cursive, with the first name "David" and last name "Hopkins" clearly distinguishable.

David R. Hopkins
Chief, EIS Branch



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION IV
50 7TH STREET N.E.
ATLANTA, GEORGIA 30323

OFFICE OF THE
REGIONAL DIRECTOR

January 31, 1975

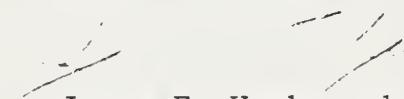
Mr. Charles W. Bartlett
State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
Post Office Box 832
Athens, Georgia 30601

Dear Mr. Bartlett:

Subject: Informal Field Review
Mill Branch Watershed
Bacon County, Georgia

We have received your notice on the subject project and a copy of the watershed work plan, August 1974 addendum, and a preliminary draft of the Environmental Impact Statement. We have reviewed these documents and this is to advise that we have no comments to offer on your preliminary studies. We are returning the documents for your use.

Sincerely yours,


James E. Yarbrough
Regional Environmental Officer

Enclosure



DEPARTMENT OF THE ARMY
SAVANNAH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 889
SAVANNAH, GEORGIA 31402

SASNC

14 February 1975

Mr. Charles W. Bartlett
State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 832
Athens, GA 30601

Dear Mr. Bartlett:

Reference your letter dated 16 January 1975 transmitting a draft work plan for the Mill Branch Watershed in Bacon County, Georgia.

A review of the draft work plan has been made by my staff. The improvements proposed should benefit the local area and are not expected to adversely affect any existing projects of the Corps of Engineers nor conflict with any future development of downstream projects.

Sincerely yours,

A handwritten signature in cursive script, reading "Edwin C. Keiser", is written over the typed name.

EDWIN C. KEISER

Colonel, Corps of Engineers
District Engineer



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Region Four
1422 West Peachtree Street-Suite 700
Atlanta, Georgia 30309

January 30, 1975

Mr. Charles W. Bartlett
State Conservationist
United States Department of Agriculture
Soil Conservation Service
P. O. Box 832
Athens, Georgia 30601

Dear Mr. Bartlett:

This is in response to your January 16, 1975 "Notice of Public Information Meeting" letter which forwarded a copy of a Draft Environmental Impact Statement for the Mill Branch Watershed Project located near Alma, Georgia, in Bacon County.

We will not be able to have a representative from the Federal Highway Administration in attendance at the scheduled meeting to be held in Alma on February 18, 1975, therefore we are forwarding our comments and concerns on the draft statement at this time for your future consideration.

First, the statement does not contain any map or maps illustrating the area to be covered by the project. We suggest a map or maps be included to outline the area to be affected, showing the highways and other modes of transportation crossing the area and the location of proposed drainage channels to be used.

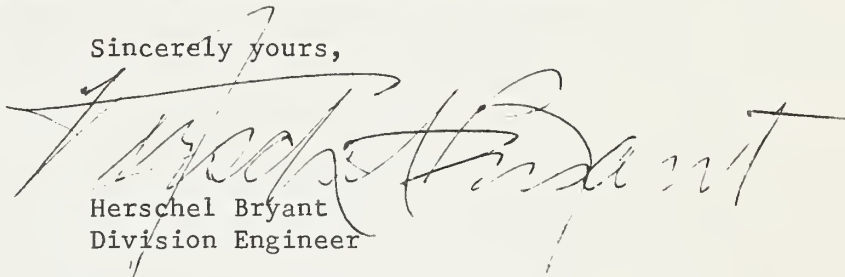
Second, the statement should discuss how the proposed channels could cause degradation of stream beds of tributaries. As pointed out in the statement, by installing channels where none previously existed, runoff will occur more rapidly; therefore, it could also be assumed that the velocity and flow quantity of existing streams will be increased. Our concern here is the possible erosion leading to undermining of existing bridge structures located on highways traversing the project area. Stability of embankments located in the area could also be a problem. If this appears to be a problem, consideration should be given towards providing rip-rap or other protective devices or measures to prevent this from occurring.

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We appreciate the opportunity to review and comment on this project. We are forwarding our copy of the draft statement on to the Georgia Department of Transportation for their further review and comment.

Sincerely yours,

A large, stylized handwritten signature in dark ink, appearing to read "Herschel Bryant". The signature is written over the typed name and title.

Herschel Bryant
Division Engineer



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

• 30 APR 1975

•
Mr. Charles W. Bartlett
State Conservationist
Soil Conservation Service
P. O. Box 832
Athens, Georgia 30601

Dear Mr. Bartlett:

This is in response to your letter of 21 February 1975 addressed to Commandant, Coast Guard concerning a draft environmental impact statement for the Mill Branch Watershed Project, Bacon County, Georgia.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,

S. A. WALLACE
Captain, U. S. Coast Guard
Acting Chief, Office of Marine Environment
and Systems
By direction of the Commandant

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